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A Game-Theoretic Approach to Regulatory Negotiation and a Framework for Empirical Analysis

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A GAME-THEORETIC APPROACH TO REGULATORY NEGOTIATION AND A FRAMEWORK FOR EMPIRICAL ANALYSIS

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I. INTRODUCTION

For at least two decades, federal agencies have departed from their traditional role as top-down regulators, and have engaged regulated parties in negotiations regarding matters that were previously either handed down as edict or resolved in quasi-judicial agency proceedings. It is no accident that the increase in agency use of more conciliatory negotiation-oriented strategies coincides with a steady increase in skepticism regarding the effectiveness of regulation at the federal level and demands for less federal control and more state and local control. In this setting, federal agencies have become more inclusive and less adversarial towards regulated parties and other stakeholders, such as environmental organizations and community groups, when exercising their regulatory powers.

This Article will discuss one class of programs intended to reach out to a variety of stakeholders and regulated parties: regulatory reinvention. Regulatory reinvention refers to a series of Clinton administration initiatives authorizing federal agencies to negotiate compromises with regulated parties, particularly in the environmental arena. The political pressure for regulatory reform and the lack of viable alternatives to reinvention ensure that the concept of reinvention, or some variant thereof, will survive well beyond the Clinton administration. President George W. Bush's Environmental Protection Agency ("EPA") Administrator, Christine Todd Whitman, has already publicly announced her support for the flagship reinvention program, Project XL, which is EPA's program for reducing regulatory burdens resulting from its pollution prevention mission.[1]

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[1] Susan Bruninga, *EPA: Project XL, Performance Partnerships are Models for Policy, Whitman Says*, Daily Env't Rep. (BNA) A-10 (Mar. 9, 2001). *See also* Christie Whitman, Administrator of the U.S. Environmental Protection Agency, Remarks at the National Environmental Policy Institute (Mar. 8, 2001), *at* http://www.epa.gov/projectxl/ hitman_

Reinvention was the centerpiece of the Clinton administration's efforts at regulatory reform. Threatened by the Republican sweep of Congress in 1994 and eager to stave off the most draconian proposals for amending environmental laws, the Clinton administration sought ways to defuse the pressure for sweeping legislative reform by engaging regulated parties. By attempting to make environmental regulation less onerous than under a more traditional regulatory approach, the Clinton administration hoped to relieve some of the political pressure for reform, and show that existing environmental laws could be made to work. Toward this end, reinvention was fairly successful in that it avoided substantial amendment to existing environmental laws. Thus, reinvention was more than a political reaction in the sense of being responsive to regulated parties as a constituency. Reinvention was a desperate attempt to save certain environmental statutes from the reform-minded 104th Congress.

This Article will apply a simple economic game-theoretic model to analyze the relationship between the increasing discontent with federal regulation and the increasingly conciliatory attitudes of the federal regulators. As regulated parties have sought relief in the courts and from Congress, federal agencies have engaged in regulatory negotiations and preemptively offered concessions in an attempt to keep their regulatory authority intact.[2] Also, this Article will argue for a critical examination of the negotiated agreements achieved under reinvention programs. This Article will also argue for clarification of the substantive parameters under which regulatory negotiations may occur to ensure that regulatory agencies faithfully represent the public interest in negotiating with regulated parties. Finally, this Article will present an empirical framework and analysis for assessing the effectiveness of federal agencies in regulatory negotiations. This Article applies each of these topics to a specific policy setting, the Endangered Species Act ("ESA").[3]

II. The Origins of Reinvention

Reinvention has occurred in several specific environmental policy arenas. While earlier reinvention initiatives in 1994 were generalized efforts to engage regulated parties in developing alternatives to existing

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[2] Philip Harter has also argued that regulatory negotiations simply make better rules. Harter first noted in 1982 that some negotiated rulemakings departed from the traditional processes of the administrative state. The National Coal Policy Project was one early pilot project, which stemmed from a negotiation initiated by Dow with some representatives of environmental organizations. Other projects with environmental consequences also had been developed using negotiations with various stakeholders. Philip J. Harter, *Negotiating Regulations: A Cure for Malaise*, 71 Geo. L.J. 1, 38–41 (1982).

[3] 16 U.S.C. §§ 1531–1544 (1994).

regulations,[4] recent initiatives have been more programmatic in nature and have focused upon certain areas of environmental law and regulation.

For example, Project XL (short for "eXcellence in Leadership") was an EPA effort to develop less cumbersome means of reducing pollution by soliciting proposals from regulated parties for projects that might not be permitted under EPA regulations, but which may result in "superior environmental results."[5] It is effectively a program to grant case-by-case waivers of environmental regulations when EPA believes that the proposed project will have better overall environmental results than could be achieved through compliance with existing regulations.[6] For example, an Intel chip-manufacturing facility in Chandler, Arizona, became the first successful Project XL applicant when it agreed to a de facto facility-wide air emissions bubble[7] resulting in emissions lower than that required by federal regulations in exchange for relief from the expensive requirement of EPA approval for certain production process changes that Intel makes frequently in developing new chip technologies.[8]

Similarly, habitat conservation planning is a mechanism by which landowners subject to ESA land use restrictions may obtain qualified regulatory relief from the United States Fish and Wildlife Service ("the Service"), which is the agency that administers the ESA.[9] A Habitat Conservation Plan ("HCP") sets forth mitigation measures to which the landowner agrees in order to aid endangered species protected under the ESA, such as enhancing habitat on-site or acquiring property off-site that can be managed as habitat.[10] In exchange, the landowner receives an incidental take permit that allows the landowner to engage in actions that would otherwise be ESA violations.[11] The Service may issue an inciden-

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[4] Rena Steinzor describes two early reinvention programs, the "Common Sense Initiative" and the "Environmental Leadership Program," in Rena I. Steinzor, *Reinventing Environmental Regulation: The Dangerous Journey from Command to Self-Control*, 22 HARV. ENVTL. L. REV. 103, 110–11 (1998).

[5] Regulatory Reinvention (XL) Pilot Projects, 60 Fed. Reg. 27,282, 27,287 (May 23, 1995).

[6] *See id.*

[7] A "bubble" is typically a regulatory construct whereby a large emitting facility will be evaluated as a single unit. This is in contrast to a more typical regulatory scheme whereby each individual smokestack in a facility is subject to separate regulation. ROBERT PERCIVAL ET AL., ENVIRONMENTAL REGULATION: LAW, SCIENCE, AND POLICY 582–84 (Aspen Law & Business 2000) (1992).

[8] *See* James Boyd et al., Intel's XL Permit: A Framework for Evaluation 7–11 (Resources for the Future, Discussion Paper 98-11, Jan. 1998), *available at* http://www.rff.org/disc_papers/PDF_files/9811.pdf.

[9] The U.S. Fish and Wildlife Service actually shares responsibility for administration of the ESA with the National Marine Fisheries Service in the Department of Commerce. The Fish and Wildlife Service is responsible for the protection of all non-marine species, which has thus far constituted most of the regulatory work under the Act. Both agencies are hereinafter collectively referred to as "the Service."

[10] Shi-Ling Hsu, *The Potential and Pitfalls of Habitat Conservation Planning Under the Endangered Species Act*, 29 Envtl. L. Rep. (Envtl. L. Inst.) 10,592, 10,594 (1999).

[11] *Id.*

tal take permit if it believes that the permitted actions taken in conjunction with the HCP will "not appreciably reduce the likelihood of the survival and recovery of the species in the wild."[12] Proponents of habitat conservation planning argue that the Service and landowners can make mutually beneficial exchanges of obligations using HCPs. The Service could surrender the possibility of prohibiting some land uses if, in exchange, the landowner undertook mitigation measures that could save a more valuable population or area of habitat. Without HCPs, landowners would not otherwise be obligated to undertake such mitigation measures, even though the mitigation measures could well be less costly to the landowners than the incidental take permit. Ideally, the net result from negotiation is genuine gains for both the Service and the landowner. While EPA and the Service have different relationships with regulated parties, the dynamics of their reinvention projects are very similar. HCPs are discussed at length in Section VI.B of this Article.

In another reinvention project, EPA created an office to facilitate the redevelopment of brownfields, which are lands that suffer from contamination by hazardous substances and, therefore, remain undeveloped because of the fear of potential liability under the Comprehensive Environmental Response, Compensation and Liability Act ("CERCLA").[13] Where hazardous substances are concerned, the contamination need not trigger CERCLA's broad liability provisions in order to preclude development: the mere threat of liability is sufficient to frighten potential developers.[14] The wasteful idling of a large amount of land served as the impetus for EPA to find ways to encourage development of contaminated or potentially contaminated land.[15] Tax breaks, liability relief, and other incentives aimed at defraying the costs of cleanup have been proposed as

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[12] 16 U.S.C. § 1539(a)(2)(B)(iv) (1994).

[13] 42 U.S.C. §§ 9601–9675 (1994 & Supp. V 1999). CERCLA imposes joint and several liability upon all owners, past, present, and prospective, whether or not they had any responsibility for the contamination. *Id.* § 9607. "Brownfields" include not only properties that are actually listed under CERCLA as "Superfund" sites, but also properties that may become so in the future. EPA defines brownfields as "[a]bandoned, idled, or under-used industrial and commercial facilities where expansion or redevelopment is complicated by real or perceived environmental contamination." Office of Solid Waste and Emergency Response ("OSWER"), EPA, *Brownfields Glossary of Terms*, *at* http://www.epa.gov/swerosps/bf/glossary.htm#brow (last modified Sept. 30, 1997) (on file with the Harvard Environmental Law Review).

[14] Liability for cleanup of hazardous waste sites can be imposed upon owners of land who acquired the land after the release of hazardous waste, and had nothing to do with its release. *See, e.g.*, New York v. Shore Realty Corp., 759 F.2d 1032, 1043 (2d Cir. 1985). This broad reach of liability has chilled the purchase of contaminated and potentially contaminated land. *See* Heidi Gorovitz Robertson, *Legislative Innovation in State Brownfields Redevelopment Programs*, 16 J. ENVTL. L. & LITIG. 1, 1 n.1 (Spring 2001).

[15] The General Accounting Office has estimated that there are 450,000 potential brownfields sites in the United States. EPA, EPA 330-B-98-001, HANDBOOK OF TOOLS FOR MANAGING FEDERAL SUPERFUND LIABILITY RISKS AT BROWNFIELDS AND OTHER SITES 3 (Nov. 1998), *available at* http://www.epa.gov/swerosps/bf/liab.htm.

incentives to stimulate the redevelopment of such properties.[16] Such incentives, like Project XL and HCPs, relax the regulatory requirements that the Clinton administration viewed as unnecessarily stringent in some cases.

While the Clinton administration readily took credit for reinvention, the roots of reinvention were sown in the early 1980s, when negotiated rulemaking became fairly common and accepted agency practice.[17] Negotiated rulemaking is a front-end addition to regulatory rulemaking that seeks to prevent possible objections to regulations by including affected stakeholders in the development of the rule. The Negotiated Rulemaking Act of 1990[18] solidified agency authority to engage in negotiated rulemaking. Under this act, agencies may assemble a negotiated rulemaking committee, a panel of stakeholders, to discuss and negotiate the development of a rule.[19] Agencies may use the discussions as a guideline for proposing the actual rule. The agency must still comply with typical rulemaking procedures, such as providing for notice of the proposed and actual rules in the Federal Register[20] and providing notice of the intention to establish a negotiated rulemaking committee.[21]

Although such preliminary discussions have no binding effect upon the agency, proponents argue that rules developed with the participation of regulated parties enjoy greater legitimacy in the parties' eyes than rules developed without their input and increase chances of compliance while reducing the risk of judicial challenge.[22] Proponents of negotiated rulemaking have argued that the traditional rulemaking process discourages information-sharing and encourages regulated parties to assume extreme positions in court challenges.[23] Negotiated rulemaking, it is argued, represents a retreat from the traditionally adversarial mode of rulemaking, and ameliorates these counterproductive tendencies.

Reinvention is similar to negotiated rulemaking in that it relies upon negotiation and collaboration with regulated parties and other stakeholders to avoid future confrontations. The core idea of reinvention, as with negotiated rulemaking, is that a cooperative process yields a bet-

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[16] *See* Meredith Preston, Superfund: *Small Business Liability Relief, Brownfields to be Addressed Jointly in House Proposal*, Daily Env't Rep. (BNA) AA-1 (Sept. 10, 2001), WL 174 DEN AA-1, 2001.

[17] Harter, *supra* note 2, at 38–40.

[18] 5 U.S.C. §§ 561–570a (1994 & Supp. V 1999).

[19] *See* Siobhan Mee, Comment, *Negotiated Rulemaking and Combined Sewer Overflows (CSOs): Consensus Saves Ossification?*, 25 B.C. ENVTL. AFF. L. REV. 213, 225 (1997).

[20] 5 U.S.C. § 563(a)(7).

[21] *Id.* § 564.

[22] Jody Freeman & Laura I. Langbein, *Regulatory Negotiation and the Legitimacy Benefit*, 9 N.Y.U. ENVTL. L.J. 60, 69–70 (2000).

[23] *See* Harter, *supra* note 2, at 21 (arguing that the traditional approach led to the wasteful expenditure of all parties on "defensive research").

ter regulatory product than an adversarial one.[24] The obvious difference between negotiated rulemaking and reinvention is that, in the parlance of the Administrative Procedure Act ("APA"),[25] negotiated rulemaking pertains to those prospective agency actions of general applicability or rulemaking actions. On the other hand, reinvention pertains to retrospective agency actions of party-specific applicability or adjudication. Thus, negotiated rulemaking will typically have broad ex ante applicability to a large number of compliance matters faced by many regulated parties. By contrast, reinvention programs, such as Project XL, are vehicles for the ex post settlement of individual disputes over compliance matters facing individual regulated parties.[26] The negotiated agreements achieved under reinvention programs thus may not be quite as revolutionary as their supporters and opponents claim.

With reinvention, however, negotiated adjudication programs have attracted the attention of legal scholars. Professor Daniel Farber notes that the negotiated agreements resulting from reinvention are indicative of a more "improvisational" means of regulating.[27] The need for improvisational regulating stems from the increasing inclination of agencies to embrace a broader view of environmental protection by including the polluter in the search for solutions, rather than taking on the polluter in an adversarial fashion. Like negotiated rulemaking, reinvention has attracted ardent supporters as well as critics. The information-sharing aspect of negotiated solutions has been an attribute of both reinvention and negotiated rulemaking.[28] Just as some commentators have argued for negotiated rulemaking because it is likely to lead to higher compliance

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[24] *See id.* at 7.

[25] 5 U.S.C. §§ 551–559, 701–706 (1994 & Supp. V 1999).

[26] It is curious that negotiated settlements have not arisen more prominently in adjudicatory agency decisions, particularly when the early failure of the APA to address informal adjudication would seem to invite ad hoc solutions such as negotiated agreements. The failure of the APA to address informal agency adjudication has been attributed to the need to maintain the informality of such adjudication. See PETER L. STRAUSS, AN INTRODUCTION TO ADMINISTRATIVE JUSTICE IN THE UNITED STATES 141–43 (1989). Informal adjudication occurs so frequently that any statutory attempt to prescribe conditions upon their use would be unwieldy. For example, when a police officer lets a driver go with a warning instead of writing a speeding ticket, or when a park ranger prohibits hikers from entering an area inhabited by grizzly bears, an informal adjudication has taken place. By contrast, the APA applies to all rulemakings, including negotiated rulemakings, so that the negotiated rulemaking process must meet all of the procedural requirements of the APA. Philip J. Harter, *Assessing the Assessors: The Actual Performance of Negotiated Rulemaking*, 9 N.Y.U. ENVTL. L.J. 32, 34 n.6 (2000).

[27] Daniel A. Farber, *Triangulating the Future of Reinvention: Three Emerging Models of Environmental Protection*, 2000 U. ILL. L. REV. 61, 61.

[28] Project XL and HCPs have attracted supporters interested in a more open regulatory process with greater information sharing. *See, e.g.*, Lisa C. Lund, *Project XL: Good for the Environment, Good for Business, Good for Communities*, 30 Envtl. L. Rep. (Envtl. L. Inst.) 10,140, 10,150 (2000) (reporting that "[w]hile XL has been time consuming, stakeholders in successful projects tell EPA they have seen real value at a local level. They say they have information, input, and access they didn't have before").

rates, other commentators have noted that reinvention projects may lead to increased compliance.[29] This seems to be a sensible supposition because the individual permittee has personally participated in the outcome, but there is no empirical evidence to demonstrate this point. Similarly, individual projects negotiated under the rubric of reinvention would appear more likely to induce compliance from regulated parties, since they played an active role in developing them.

On the negative side, some commentators worry that well-financed regulated parties will almost certainly wield undue influence over the negotiated rulemaking process, particularly in negotiations regarding environmental regulations.[30] This concern is echoed in the reinvention context.[31] Finally, significant legal issues arise with respect to both negotiated rulemaking and reinvention. With respect to negotiated rulemaking, administrative law scholars have argued that negotiated rulemaking is inconsistent with the underlying norms of the administrative process,[32] and it is fundamentally undemocratic unless all interested parties are represented in the negotiating process.[33] Opponents to reinvention make similar arguments, but also raise questions regarding the legality of reinvention projects.[34] As one disgruntled EPA official once remarked of Project XL, "if it isn't illegal, it isn't XL."[35]

III. Empirical Studies

With the abundance of scholarly rhetoric, empirical analyses of both reinvention and negotiated rulemaking have been surprisingly scarce. Only two major empirical studies on negotiated rulemaking have been conducted. There can be no conclusion as of yet regarding the effectiveness of negotiated rulemaking.

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[29] *See* Karen L. Smith, *Habitat Protection for the New Millenium: An Analysis of Domestic and International Regimes in North America*, 13 Geo. Int'l Envtl. L. Rev. 509, 539 (2001) (noting that "Habitat Conservation Plans and the 'no surprises' policy have evolved recently in an effort to ensure more cooperation and compliance with the ESA").

[30] The fundamental problem is one of adequate representation of disparate interests in the negotiation phase of a negotiated rulemaking. "In negotiations about environmental pollution, for example, the diverse, geographically scattered individuals who breathe the air and drink the water cannot always be represented effectively by standard environmental groups." Susan Rose-Ackerman, *Consensus Versus Incentives: A Skeptical Look at Regulatory Negotiation*, 43 Duke L.J. 1206, 1210 (1994).

[31] Steinzor, *supra* note 4, at 141–43.

[32] William Funk, *Bargaining Toward the New Millennium: Regulatory Negotiation and the Subversion of the Public Interest*, 46 Duke L.J. 1351, 1374 (1997).

[33] *See* Rose-Ackerman, *supra* note 30, at 1211.

[34] Reinvention projects such as Project XL contemplate the relaxation of some regulatory requirement promulgated to fulfill a statutory mandate. It is not clear that EPA possesses the authority to relax such requirements. Bradford C. Mank, *The Environmental Protection Agency's Project XL and Other Regulatory Reform Initiatives: The Need for Legislative Authorization*, 25 Ecology L.Q. 1, 4 (1998).

[35] Rena I. Steinzor, *Regulatory Reinvention and Project XL: Does the Emperor Have Any Clothes?*, 26 Envtl. L. Rep. (Envtl. L. Inst.) 10,527, 10,527 (1996).

The first empirical study, by Neil Kerwin and Laura Langbein, compared reactions by participants in six conventional rulemakings with participants in eight negotiated rulemakings.[36] Kerwin and Langbein found that participants in negotiated rulemakings tended to have more favorable evaluations of the process than those in conventional rulemakings, and they generally believed that negotiated rulemakings were more instructive and generated better rules with higher satisfaction.[37]

A second empirical study, by Professor Cary Coglianese, sought to refute claims that negotiated rulemaking results in the speedier development of a final rule and a lower incidence of litigation. Coglianese sought to demonstrate that these two benefits of negotiated rulemaking have not materialized.[38] Coglianese looked at negotiated rulemakings from 1983 to 1996 and measured the average length of time between an agency's announcement of a negotiated rulemaking and publication of the final rule, and he found that negotiated rulemaking resulted in at most only a modest savings of time.[39] Coglianese found little evidence to support the claim that negotiated rulemakings produce rules that are less prone to judicial challenge than the traditional rulemaking process.[40] However, Professor Philip Harter is highly critical of Coglianese's research methodology, and he cites individual cases of negotiated rulemakings in Coglianese's study that were aberrations that should have been excluded.[41]

Few empirical studies on reinvention have been conducted, but the majority of these have focused upon Project XL. Allen Blackman and Janice Mazurek's empirical study examined eleven of the earliest Project XL proposals in an effort to obtain a rough estimate of the project development costs associated with Project XL and to identify factors that are likely to increase the cost.[42] They found that project development costs

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[36] The Kerwin and Langbein study is reported by Freeman & Langbein, *supra* note 22, at 78–121. Respondents were asked a series of subjective questions regarding their satisfaction with and the effectiveness of the process. The same questions were posed to participants in both the conventional and negotiated rulemaking cases.

[37] *Id.* at 80–81.

[38] Cary Coglianese, *Assessing Consensus: The Promise and Performance of Negotiated Rulemaking*, 46 DUKE L.J. 1255, 1309 (1997).

[39] *Id.* at 1278–86.

[40] *Id.* at 1286–1309.

[41] Harter, *supra* note 26, at 41–44. While there is some merit in Harter's criticisms, they do not necessarily refute Coglianese's claims. The critical question that must be asked of Coglianese's data set is this: do the data contain any systematic bias such that his results are inherently skewed upwards or downwards? Harter's criticisms, while imprecise, suggest that there may be such a bias in Coglianese's data set. Coglianese, in a response to Harter, argues that even aberrant cases of unusually long negotiated rulemaking should be included in the data set because these still represent an effort and devotion of EPA resources towards developing a rule. As such, there is no reason, statistically or otherwise, to exclude such cases. Cary Coglianese, *Assessing the Advocacy of Negotiated Rulemaking: A Response to Philip Harter*, 9 N.Y.U. ENVTL. L.J. 386, 398 (2001).

[42] Allen Blackman & Janice Mazurek, The Cost of Developing Site-Specific Regulations: Evidence from EPA's Project XL 5 (Resources for the Future, Discussion Paper 99-35-REV, Mar. 2000), *available at* http://www.rff.org/disc_papers/PDF_files/9935rev.pdf.

averaged $350,000 for the regulated parties and $110,000 for the EPA regional offices evaluating the proposal.[43] Significantly, over half of the firms' project development costs stemmed from interactions with EPA, while only one-fifth of the project development costs were attributable to the actual stakeholder negotiations.[44] This result should surprise legal scholars who have focused upon the high costs of the negotiation process.[45] The complexity of the proposals, rather than costs of negotiation process, drove up project development costs.

In another Project XL study, Lawrence Susskind and Joshua Secunda examined all seventeen of the Project XL proposals submitted by mid-1997, and they interviewed a number of EPA officials involved with Project XL.[46] Susskind and Secunda found that a number of institutional barriers prevented effective and widespread implementation of Project XL.[47] The most significant barrier was institutional resistance to the very idea of Project XL, due to EPA's long history as an enforcement agency.

Various other case studies have been conducted on individual Project XL projects, with similarly mixed reviews.[48] Albert Lin conducted a series of interviews with participants in the habitat conservation planning process and found institutional barriers and frustrations on the part of regulated parties similar to those experienced in Project XL.[49] Some commentators have examined HCPs in detail and commented that HCPs appear to achieve little protection for endangered species.[50] Others have been critical of the Service's willingness to issue incidental take permits when it did not have adequate data to evaluate the impact of the take upon the species.[51] Results of empirical studies on negotiated rulemakings and reinvention projects should be interpreted cautiously. Interviews

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For discussion of actual costs, see *id.* at 8–11.

[43] *Id.* at 15.

[44] *Id.*

[45] *See, e.g.*, Mark Seidenfeld, *Empowering Stakeholders: Limits on Collaboration as the Basis for Flexible Regulation*, 41 WM. & MARY L. REV. 411, 484 (2000); Michael C. Dorf & Charles F. Sabel, *A Constitution of Democratic Experimentalism*, 98 COLUM. L. REV. 267, 384 (1998).

[46] Lawrence E. Susskind & Joshua Secunda, *The Risks and the Advantages of Agency Discretion: Evidence from EPA's Project XL*, 17 UCLA J. ENVTL. L. & POL'Y 67 (1999).

[47] *Id.*

[48] *See, e.g.*, Boyd et al., *supra* note 8, at 41–42; Benjamin Starbuck Wechsler, *Rethinking Reinvention: A Case Study of Project XL*, 5 ENVTL. LAW. 255, 276–77 (1998).

[49] The difference is, however, that HCPs have seen widespread use. The history of HCPs is discussed in detail in Part V.D.

[50] *See* Daniel A. Hall, *Using Habitat Conservation Plans to Implement the Endangered Species Act in Pacific Coast Forests: Common Problems and Promising Precedents*, 27 ENVTL. L. 803, 833–34 (1997); Karin P. Sheldon, *Habitat Conservation Planning: Addressing the Achilles Heel of the Endangered Species Act*, 6 N.Y.U. ENVTL. L.J. 279, 311–13 (1998); Jennifer Jester, *Habitat Conservation Plans Under Section 10 of the Endangered Species Act: The Alabama Beach Mouse and the Unfulfilled Mandate of Species Recovery*, 26 B.C. ENVTL. AFF. L. REV. 131, 186–87 (1998).

[51] *See generally* PETER KAREIVA ET AL., AMERICAN INSTITUTE OF BIOLOGICAL SCIENCES, USING SCIENCE IN HABITAT CONSERVATION PLANS (1999).

can be illuminating, but can also be misleading, as the Blackman and Mazurek study seems to suggest with respect to earlier findings on the burdens of the negotiating process.[52] Using interviewees to evaluate subjectively the success of a negotiated rulemaking or a reinvention project can also be misleading because, as William Funk has noted, the "success" of a negotiated agreement is hard to define.[53] The mere consummation of a negotiated agreement and the absence of subsequent judicial challenges may not provide a complete and accurate picture because the regulated parties might have obtained everything they wanted at the expense of environmental regulation.[54] Even a high compliance rate could be the product of a deal in favor of the regulated parties.[55] On the other hand, the failure to consummate a negotiated agreement is not necessarily a complete waste: the negotiation itself may have narrowed the issues and facilitated the exchange of valuable information.[56] Moreover, in attempting to determine the success of a negotiated agreement, there is also a problem with determining a correct baseline against which to measure the project.[57] If a project involving changes to a facility is purported to achieve a fifty percent reduction in emissions, would that reduction have occurred anyway, given that the facility was likely to be retired? The inability to define baselines and other issues have plagued environmental policy-makers for decades and divided agency officials over how to deal with them. Empirically, perhaps the best solution is to attempt to ascertain whether the bargaining process is roughly fair and if either the regulator or the regulated parties are consistently exploiting the negotiation process.

IV. WHY REGULATORY NEGOTIATION IS INEVITABLE AND WHAT CAN BE DONE ABOUT IT

Professor Farber has noted a persistent and widespread disparity between the mandates of environmental regulation and the enforcement that actually occurs. These take on one of two forms.[58]

Negative slippage occurs when there are technical, but relatively minor, violations of statutory mandates, such as missed deadlines, failure to adhere to mandated standards, or noncompliance by regulated parties.[59] Examples include the failure by EPA to establish effluent guidelines un-

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[52] *See* Blackman & Mazurek, *supra* note 42, at 8–9. Blackman and Mazurek's findings counter the popular intuition that negotiation is the greatest cost of reinvention.

[53] Funk, *supra* note 32, at 1366.

[54] *See id.*

[55] *See id.*

[56] *Id.*

[57] Steinzor, *supra* note 4, at 130–31.

[58] Daniel A. Farber, *Taking Slippage Seriously: Noncompliance and Creative Compliance in Environmental Law*, 23 HARV. ENVTL. L. REV. 297, 298 (1999).

[59] *Id.* at 299.

der Section 304(b) of the Clean Water Act[60] by the original 1973 deadlines, lax state enforcement of federally delegated air pollution programs,[61] and the failure of thousands of point source dischargers to obtain the required permits under the Clean Water Act.[62]

Positive slippage occurs when regulatory agencies affirmatively create differences between what environmental statutes mandate and what is actually required of regulated parties. This includes the replacement of standards by negotiated agreement, which epitomizes reinvention. Examples include HCPs under the ESA[63] and the rewriting of statutory standards governing discharges of toxic water pollutants under the Clean Water Act.[64]

Farber does not discuss the causal relationship between negative slippage and positive slippage. Regulatory agencies create positive slippage because they are faced with negative slippage, caused by either enforcement problems or political obstacles that are impossible to overcome when implementing their mandates. Positive slippage is a way of incorporating flexibility into statutes that would otherwise suffer from negative slippage or, worse yet, suffer significant legislative or judicial weakening.

Reinvention programs most clearly illustrate the causal link between positive and negative slippage. For example, habitat conservation planning under the ESA is an attempt by the Service to address negative slippage stemming from two realities that confront the Service: (1) that strict enforcement of the ESA would lead to vehement political protest from regulated parties in the western United States that most often face ESA land use restrictions,[65] and (2) that the Service lacks the resources and the political will to enforce the ESA vigilantly.[66] Thus, the political and budgetary obstacles to ESA enforcement led to negative slippage in the

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[60] 33 U.S.C. § 1314(b) (1994).

[61] Farber, *supra* note 58, at 301.

[62] *Id.* at 304. "Point source" dischargers of water pollution must obtain permits under Section 402 of the Clean Water Act. 33 U.S.C. § 1342. Point source dischargers are defined as "discernible, confined and discrete" sources of pollution. *Id.* § 1362(14).

[63] Farber, *supra* note 58, at 307.

[64] *Id.* at 306.

[65] When the ESA was in danger of fairly dramatic reform, an unlikely ally emerged: then-House Speaker Newt Gingrich. In an unusual meeting that included the Speaker and noted ecologists, including Edward O. Wilson, Gingrich assured the scientists that a draconian amendment of the ESA would not reach the floor as long as he was Speaker. He kept his promise when a bill sponsored by House Resources Chairman Don Young and Representative Richard Pombo that would have effectively repealed the ESA sailed through Young's committee by a vote of 27-17, but met Gingrich's refusal to bring it up on the House floor. Michael J. Bean, *The Gingrich That Saved the ESA*, ENVTL. FORUM, Jan.-Feb. 1999, at 26. However, numerous sweeping reforms to several environmental laws have been proposed since 1994, and Congress has seriously considered passage of several of them. *See infra* note 117 and accompanying text.

[66] *See* Donald J. Barry, *Opportunity in the Face of Danger: The Pragmatic Development of Habitat Conservation Plans*, 4 HASTINGS W.-NW. J. ENVTL. L. & POL'Y 129, 130 (1998).

form of noncompliance by regulated parties, which in turn led the Service to seek regulatory flexibility, whether the ESA authorized it or not.

Project XL can be viewed as a similar form of positive slippage made in reaction to the prospect of negative slippage or threat of amendment. Similarly, Project XL, developed in 1995 while the Clinton administration was busy fending off legislative proposals to weaken several pollution control statutes, intended to insert flexibility into statutory mandates that even EPA found to be frustrating at times.[67] For example, several Project XL proposals have relaxed New Source Review standards,[68] which applied to all new stationary sources of air pollution. New Source Review is a highly unpopular regulatory program and frequently has been targeted for repeal or amendment.[69]

Is it desirable to avoid either negative or positive slippage? A strong argument can be made that both kinds of slippage provide necessary flexibility in a system of environmental laws that fails to address the complexities of individual cases. If, as John Dwyer argues, some environmental laws are unrealistic manifestos that politicians have created to satisfy environmentally minded constituents,[70] then negative slippage may be an important asset for making imperfect environmental laws function effectively. Such flexibility can alleviate the unintended burdens imposed by unrealistic manifestos and symbolic legislation. Positive slippage also can effectuate minor, common-sense amendments to environmental laws that Congress would ordinarily pass, but those laws might fail in a partisan and gridlocked Congress.

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[67] *See, e.g.*, Clean Water Act Amendments of 1995, H.R. 961, 104th Cong. (1995) (sponsored by Rep. Bud Shuster (R-Pa.)); S. 375, 104th Cong. (1995) (introduced by Sen. Spencer Abraham (R-Mich.), this bill would have imposed a moratorium on sanctions under the Clean Air Act); S. 767, 104th Cong. (1995) (introduced by Sen. Pete Domenici (R-N.M.), this bill would have amended the Clean Air Act to delay the "imposition of sanctions" upon state vehicle inspection and maintenance programs).

[68] New Source Review imposes stringent emissions standards on any new stationary sources of pollution that the EPA Administrator believes "causes, or contributes significantly to, air pollution which may reasonably be anticipated to endanger public health or welfare." Clean Air Act § 111(b)(1)(A), 42 U.S.C. § 7411(b)(1)(A) (1994). New Source Review has been criticized for discouraging the construction of new and generally cleaner facilities and encouraging firms to maintain their older, less efficient, and generally dirtier facilities. Byron Swift, *The Acid Rain Test*, ENVTL. FORUM, May-June 1997, at 18 (writing that "[t]he [New Source Review provisions] resulted in a net decrease in emissions, but they also slowed the rate of capital turnover, increasing the age of capital by an average of almost 25 percent, thus undermining the impact on emissions reductions").

[69] *See, e.g.*, Steve Cook, *Air Pollution: Cap-and-Trade Approach to Replace New Source Review, EPA Official Says*, Daily Env't Rep. (BNA) AA-1 (Sept. 7, 2001), WL 173 DEN AA-1, 2001; Steve Cook, *Air Pollution: EPA Said to Have Delayed Report on New Source Review Due to DOE Objection*, Daily Env't Rep. (BNA) A-5 (Aug. 30, 2001), WL 168 DEN A-5, 2001. The routine process changes in the Intel project, for example, would have at least required an EPA determination that it was not subject to New Source Review standards. *See* Boyd et al., *supra* note 8.

[70] *See* John P. Dwyer, *The Pathology of Symbolic Legislation*, 17 ECOLOGY L.Q. 233, 233–34 (1990).

Reinvention reflects the recognition that the traditional regulatory regime was failing in its overly centralized approach. For example, some commentators have noted that reinvention is part of a larger paradigm shift in the way regulatory agencies govern, resulting from a Congressional failure to address statutory shortcomings of both positive and negative slippage.[71] To the extent that reinvention provides for additional regulatory flexibility, it represents a further evolution of the administrative state.[72]

Even in a troubled administrative state, regulatory negotiations can produce positive results. Jody Freeman noted that one of Kerwin and Langbein's important findings was that parties involved in negotiated rulemaking were able to use face-to-face contact as a learning experience.[73] Regulatory negotiations also provide an opportunity to defuse the tension in some of the most controversial resource conflicts. Professor Barton Thompson has stated that one reason why resource users resist collective action solutions is because it is evidently human nature to blame others for the existence of resource shortages.[74] This leads to an extreme reluctance by resource users to agree to a collective action solution if it involves minimal personal sacrifices.[75] Thompson suggests that the one hope for curing resource users of such self-serving myopia is face-to-face contact and the exchange of views.[76] The vitriolic language occurring within some environmental regulatory issues suggests that there is a similar human reaction occurring with respect to some resource conflicts.[77] Solutions to environmental problems and resource conflicts in which regulated parties and environmental organizations hold such strong and disparate views may require face-to-face contact to remove some of the demonization that has arisen in these conflicts. Reinvention, with the emphasis on negotiations and face-to-face contact, provides such an opportunity.[78]

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[71] *See* David A. Dana, *The New Contractarian Paradigm in Environmental Law*, 2000 U. ILL. L. REV. 35, 36.

[72] *Id.* J. B. Ruhl has noted that the development of HCPs under the Clinton administration was an ESA reform that occurred at a time when Congress was making the most bluster about reforming the ESA. J. B. Ruhl, *While the Cat's Asleep: The Making of the "New" ESA*, 12 NAT. RESOURCES & ENV'T 187, 187 (1998).

[73] *See* Freeman & Langbein, *supra* note 22, at 78–81.

[74] *See* Barton Thompson, *Tragically Difficult: Obstacles to Governing the Commons*, 30 ENVTL. L. 241, 278 (2000).

[75] *Id.* at 275.

[76] *Id.* at 277.

[77] *See, e.g.*, Gloria Flora, *Towards a Civil Discourse: The Need in Public Land Management*, 21 PUB. LAND & RESOURCES L. REV. 25, 25–26, 31 (2000). Flora is a former supervisor of the Lewis & Clark National Forest in Montana and the Humboldt-Toiyabe National Forest in Nevada who resigned her post in protest because of threats of violence that were made against her and her employees. *See also* Douglas Jehl, *Cries of the Suckerfish Rile Farmers' Allies*, N.Y. TIMES, June 20, 2001, at A1.

[78] Funk would caution against using negotiated rulemaking purely as an exercise in consensus-building. Funk warns that the drive to achieve consensus in a negotiated rule-

Farber has argued for optimizing this trend towards the regulatory negotiation that characterizes negotiated rulemaking and reinvention.[79] Faced with the reality that some negotiation will inevitably take place because of the slippage inherent in our system of regulation, Farber argues that the best model for allowing negotiation to proceed is a bilateral one involving negotiations between a regulatory agency and regulated parties. A system of bilateral negotiation would clearly be superior to a system of self-regulation that would inevitably descend into a tragedy of the commons.[80]

A system of bilateral negotiation between agencies and regulated parties would even be superior to a system of multilateral negotiation that would involve potentially a large variety of stakeholders, due to the transaction costs of assembling all of the affected stakeholders and the difficulties of reaching a consensus among a large number of parties.[81] Moreover, multilateral negotiation gives rise to the troubling idea that there should be joint governance among the parties.[82] Since environmental organizations lack the resources to participate in such a post-negotiation joint governance scheme, there is a heightened danger of regulatory capture by regulated parties, which generally enjoy greater financial resources.[83]

The correct balance between regulatory flexibility and accountability, argues Farber, is to allow bilateral negotiation with checks to ensure that the negotiation process is not captured by regulated parties. Built-in checks would include transparency, which would allow environmental organizations to monitor regulatory bargains, and the availability of citizen suits, which would allow environmental organizations to remedy regulatory bargains that exceed the dictates of the underlying statute. Environmental organizations would thus operate as watchdogs, rather than as active participants in negotiations. Kerwin and Langbein's finding that resource constraints sometimes caused environmental organizations, es-

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making often has the effect of neglecting legal requirements. "In short, the facts don't matter as long as everyone is happy." Funk, *supra* note 32, at 1381.

[79] Farber, *supra* note 27, at 80.

[80] Garrett Hardin describes the "tragedy of the commons" as resource degradation in the absence of ownership of the resource. *See* Garrett Hardin, *The Tragedy of the Commons*, 162 SCIENCE 1243, 1244–45 (1968). Conservation of the resource is in no one's self interest because of the self-interest of others to exploit the resource as much as possible. Thus, a fish left in the sea is a fish for another fisherman to catch. In such a situation, the rational pursuit of self-interest by each resource user results in wasteful behavior from the collective perspective of the resource users as a group. An industry governed by self-regulation can be expected to follow the same pattern of behavior, notwithstanding the countervailing factors cited by Farber in his article that support the proposition that self-regulation can be effective. Farber, *supra* note 27, at 68–72. Restraint in pollution would not be rational from the individual firm's point of view when its competitors are not restraining themselves and are enjoying higher profits as a result.

[81] Farber, *supra* note 27, at 75–76.

[82] *Id.* at 74–75.

[83] *Id.* at 74.

pecially smaller local ones, to skip negotiated rulemakings appears to support this conclusion.[84] The resources of such organizations could thus be spent more parsimoniously on monitoring, rather than developing negotiated compromises. This would allow the environmental organizations to play a deterrent role by monitoring regulatory negotiations rather than by participating directly in such negotiations.

This Article builds upon Farber's conclusion that a bilateral system of regulatory negotiation is the most effective one. However, environmental organizations can function as watchdogs only if legal standards are clear enough to indicate when a statutory mandate is being violated. Environmental organizations have been critical of reinvention projects,[85] but there has been no litigation challenging either Project XL or individual projects.[86] Exactly what would be the basis of such a suit is unclear, as EPA's own standards for Project XL are still somewhat vague. EPA's original announcement listed eight Project Criteria by which the adequacy of Project XL proposals would be judged.[87] However, these criteria were vague and caused substantial confusion. Subsequent clarifications[88]

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[84] *See* Freeman & Langbein, *supra* note 22, at 63.

[85] *See, e.g.*, NATURAL RES. DEF. COUNCIL, LEAP OF FAITH: SOUTHERN CALIFORNIA'S EXPERIMENT IN NATURAL COMMUNITY CONSERVATION PLANNING (1997) (criticizing HCPs), *available at* http://www.nrdc.org/wildlife/habitat/lof/lofinx.asp; The Good Neighbor Project for Sustainable Industries, *Does EPA Oversight Undermine Community-Based Pollution Prevention Agreements?* (criticizing Project XL), *at* http://gnp.enviroweb.org/xlgna.html (last visited Dec. 1, 2001) (on file with the Harvard Environmental Law Review). An XL agreement with egg producers, for example, drew fire from the Natural Resources Defense Council and the Sierra Club. Press Release, Natural Res. Def. Council, NRDC Denounces New EPA Sweetheart Deal with Egg Producers (Oct. 26, 2000), *available at* http://www.nrdc.org/media/pressReleases/001026.asp; *Stop U.S. EPA from Letting Big Poultry Operations Escape Water Pollution Rules*, ENVTL. QUALITY ACTIVIST NEWSL. (Sierra Club, Washington, D.C.) Apr. 2001, *at* http://www.sierraclub.org/pollution/ newsletter/nsl-oct2000.asp (last visited Dec. 1, 2001) (on file with the Harvard Environmental Law Review). NRDC attorney John Walke, a former EPA attorney, has criticized the Project XL implementation process. Joel A. Mintz, *Whither Environmental Reform? Some Thoughts on a Recent AALS Debate*, 31 Envtl. L. Rep. (Envtl. L. Inst.) 10,719, 10,720–21 (2001). *But see, e.g.*, Nat'l Wildlife Fed'n, *Habitat Conservation Plans*, *at* http://www.nwf.org/smartgrowth/learnhcp.html (last visited Dec. 1, 2001) (on file with the Harvard Environmental Law Review). The National Wildlife Federation has been a qualified supporter of HCPs, praising its benefits while being critical of its implementation. *See id.*

[86] A Westlaw search on July 5, 2001, turned up no cases in which the phrase "Project XL" appeared. *See also* Michael J. Bean, *Major Endangered Species Act Developments in 2000*, 31 Envtl. L. Rep. (Envtl. L. Inst.) 10,283, 10,284–85 (Mar. 2001).

[87] The criteria were environmental results, cost savings and paperwork reduction, stakeholder support, innovation/multi-media pollution prevention, transferability, feasibility, monitoring, reporting and evaluation, and shifting of risk burden. Regulatory Reinvention (XL) Pilot Projects, 60 Fed. Reg. 27,282, 27,287 (May 23, 1995).

[88] EPA subsequently stated that the first three criteria "actually define Project XL" and sought to clarify the meaning of these criteria. Regulatory Reinvention (XL) Pilot Projects, 62 Fed. Reg. 19,872 (Apr. 23, 1997). EPA listed some "project themes" that would be of particular interest, such as "projects specifically aimed at creating innovative environmental technologies," "facility-wide emissions limits under the Clean Air Act that also incorporate continuous emissions reduction," and "regulatory mechanisms to encourage consideration of the environment throughout the entire life cycle of a product." Regulatory

evidently have not been enough to generate interest from regulated parties.[89] In addition, Project XL continues to operate under uncertain statutory legitimacy.[90] There have also been surprisingly few challenges to habitat conservation planning and individual HCPs,[91] perhaps due to the vague standard for approving HCPs.[92] The Habitat Conservation Planning and Incidental Take Permit Processing Handbook ("HCP Handbook") provided an overview of the HCP process and was intended to "establish clear standards that ensure consistent implementation of the [HCP] program nationwide . . . ."[93] However, the HCP Handbook offers little more than a restatement of the statutory requirements that must be met before the Service may issue an incidental take permit. While it concedes that the Service "cannot mandate that HCPs contribute to [species] recovery," it states that "applicants should be encouraged to develop HCPs that produce a net positive effect on a species."[94] This statutory interpretation has been criticized as being unnecessarily narrow and "crabbed."[95] Also, the HCP Handbook does not state what it would mean to "appreciably reduce the likelihood of survival of species in the wild," a condition that would preclude the issuance of an incidental take permit and the implementation of an HCP.

Thus, vague standards governing reinvention projects have frustrated challenges to their legitimacy. Environmental organizations have been severely hampered from fulfilling their role as watchdogs over the regu-

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Reinvention (XL) Pilot Projects, 62 Fed. Reg. at 19,873. EPA also established a "two-tiered assessment" for evaluating whether a project resulted in "superior environmental performance." Regulatory Reinvention (XL) Pilot Projects, 62 Fed. Reg. at 19,874. For a discussion of the development of EPA's Project XL standards, see generally Wechsler, *supra* note 48, at 255–58.

[89] As of March 22, 2001, there were fifty Project XL projects in "Implementation and Evaluation." EPA, *Project XL Implementation and Evaluation, at* http://www.epa.gov/projectxl/implemen.htm (last visited Dec. 1, 2001) (on file with the Harvard Environmental Law Review).

[90] Mank, *supra* note 34, at 24–30.

[91] Bean, *supra* note 86, at 10,284–85. The few cases that have been brought are listed *infra* note 158.

[92] For example, an incidental take permit may not be issued if, among other things, it and the HCP will "appreciably reduce the likelihood of survival and recovery of the species in the wild." 16 U.S.C. § 1539(a)(2)(B)(iv). There are other requirements, such as a finding that the permitted project "will, to the maximum extent practicable, minimize and mitigate the impacts of such taking." *Id.* § 1539(a)(2)(B)(ii). Another requirement is that "the applicant will ensure that adequate funding for the plan will be provided." *Id.* § 1539(a)(2)(B)(iii). Also, the incidental take of species must be "incidental to, and not the purpose of, the carrying out of an otherwise lawful activity." *Id.* § 1539(a)(1)(B). Finally, the HCP must specify the impact of the incidental taking, the steps the permittee will take to minimize the impact of the incidental take, and what alternatives were considered. *Id.* § 1539(a)(2)(A). In practice, it has been the "maximum extent practicable, minimize and mitigate" standard and the "appreciably reduce the likelihood of survival" standard that have been most important. *Id.* § 1539(a)(2)(B)(ii), (iv).

[93] U.S. DEP'T OF COMMERCE ET AL., HABITAT CONSERVATION PLANNING AND INCIDENTAL TAKE PERMIT PROCESSING HANDBOOK 1-1 (1996).

[94] *Id.* at 1-15, 3-20 to 3-21.

[95] Sheldon, *supra* note 50, at 312; Jester, *supra* note 50, at 182–86.

latory process, as Farber described. With such amorphous governing standards, environmental organizations are left to wonder whether the agencies have violated underlying environmental statutes. Ensuring that agencies remain faithful to the spirit of the statutes requires clear and concrete standards describing how much agencies may concede in a negotiated agreement. In order for environmental organizations to act as a check against the capture of the bilateral negotiation process by regulated parties, clear standards must exist so that agency violations are more recognizable and causes of action more easily established in a lawsuit challenging a negotiated agreement. Clearer standards will make agencies more effective negotiators by providing them with better guidance. Moreover, clear standards provide regulatory agencies with legal cover by denying them the unwanted discretion to grant broad concessions to regulated parties.

This Article will present an analytical method for critically examining regulatory negotiated agreements. Some empirical methodology or framework is necessary for evaluating the effectiveness of agencies in striking regulatory bargains and to help ensure that the negotiation process is reasonably balanced. This Article will introduce some concepts to accomplish this and, in so doing, hopefully will improve the regulatory negotiations process.

V. THE ESA

A. The Controversy Surrounding the ESA

In some places in the United States, the ESA is so controversial that it is avoided in casual conversation like religion or politics. In communities where the local economy depends upon a consumptive use of land, such as logging towns in the Pacific Coast states and ranching or mining towns in the Mountain states, potential ESA land use restrictions pose a threat to important local industries. The ESA has divided these communities into those who support the local businesses that revolve around the consumptive land uses and those who support environmental goals that conflict with those land uses.

The ESA may be the most powerful federal environmental law,[96] making it an inviting target for those hostile to environmental protection. The ESA imposes onerous restrictions upon federal agencies, which are required to consult with the Service with respect to any federal action that may affect species listed as "endangered" or "threatened"[97] and to ensure that no action will jeopardize the "continued ex-

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[96] *See, e.g.*, Jerry L. Anderson, *The Environmental Revolution at Twenty-Five*, 26 RUTGERS L.J. 395, 405 (1995).

[97] The ESA defines "endangered species" as "any species which is in danger of extinc-

istence" of any listed species.[98] Even the failure to take action to prevent the habitat degradation of listed species can be construed as a violation of the ESA.[99]

However, the most controversial provision of the ESA prohibits the "take" of species listed as endangered or threatened under the ESA,[100] a prohibition that applies to private property owners[101] and state and local governmental entities.[102] Moreover, the term "take" has been defined and interpreted broadly, encompassing habitat modification adverse to listed species.[103]

The actual effect of this broad prohibition against the "take" of endangered or threatened species on private property is more exaggerated than studied. Nevertheless, in theory, the ESA can be used to completely prohibit landowners from engaging in otherwise lawful land uses, such as logging, agriculture, and development. For example, the logging of old-growth forest that is home to a northern spotted owl, which is designated as threatened under the ESA, may constitute a "take" and may thus be prohibited under the ESA.[104] Similarly, developing single-family homes on land that is habitat for the endangered golden-cheeked warbler ("GCW") may constitute a "take" in that it adversely modifies habitat for the species and is thus also prohibited.[105] In an extreme case, the ESA could completely prohibit a land use for which a property is uniquely suited and valuable. For example, a property with a stand of trees may be extremely valuable for logging purposes, while no other activities would yield value to the landowner.[106] Similarly, a vacant lot of land in a developing residential area could be extremely valuable if developed but valueless if development is prohibited.

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tion throughout all or a significant portion of its range . . . ." 16 U.S.C. § 1532(6). A "threatened species" is "any species which is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range." *Id.* § 1532(20).

[98] *Id.* § 1536(a)(2).

[99] *See generally* Defenders of Wildlife v. Adm'r, EPA, 882 F.2d 1294 (8th Cir. 1989).

[100] Section 9(a)(1) of the ESA provides that "it is unlawful for any person . . . to . . . take any such species within the United States." 16 U.S.C. § 1538(a)(1)(B).

[101] *See generally* Babbitt v. Sweet Home Chapter of Comtys. for a Great Or., 515 U.S. 687 (1995) (Scalia, J., dissenting).

[102] Palila v. Haw. Dep't of Land & Natural Res., 471 F. Supp. 985, 996 (D. Haw. 1979), *aff'd*, 639 F.2d 495 (9th Cir. 1981).

[103] To "take" a threatened or endangered species means to "harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct." 16 U.S.C. § 1532(19). "Harm," in turn, has been interpreted to include "significant habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering." 50 C.F.R. § 17.3 (2000).

[104] 50 C.F.R. § 17.3.

[105] *Id.*

[106] Such a property could be valuable ecologically, but that would be of little value to the landowner interested in profitably developing the land.

The ESA has galvanized environmentalists, most of whom believe in the importance of the ESA and perhaps the need to strengthen it. Environmentalists have rallied around the ESA for several reasons. First, the ESA taps into a fairly widespread belief that the present generation owes a duty to future generations to leave them the same ecological quality that currently exists.[107] Environmentalists have apparently convinced the American public, at least abstractly, of the idea that preserving biological diversity is a critical component of ecological quality and that the ESA is necessary in accomplishing this.[108] Second, the ESA taps into another widespread belief of the American public that humankind has an ethical duty to other species, particularly when it has the power to extinguish them so easily.[109] The ESA recognizes the need to constrain that power. Finally, the ESA has protected species that have great aesthetic appeal, and environmentalists have paraded the most appealing endangered species before the American public to engender sympathy that translates into political support. These species include the manatee, sea lion, bald eagle, and Florida panther, and have been pejoratively dubbed "charismatic megafauna," referring to their size and attractiveness.[110]

The ESA has also engendered more hostility from property rights advocates than any other area of environmental law.[111] Opponents of the ESA have painted the ESA as an unwarranted intrusion upon private property rights by governmental authorities, and have blamed it for the psychological trauma of displaced timber industry workers[112] and even

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[107] *See, e.g., Endangered Species, Hearings Before the Sub-Committee on Fisheries and Wildlife Conservation of the House Committee on Merchant Marine and Fisheries*, 91st Cong. 50 (1969) (Statement of Rep. Dante Fascell asserting that "[t]hose of us given the stewardship of public office have a right and duty to do all we can to preserve the beauties of nature for our children and future generations to enjoy").

[108] Barton H. Thompson, *People or Prairie Chickens: The Uncertain Search for Optimal Biodiversity*, 51 STAN. L. REV. 1127, 1136–37 (1999).

[109] *See* Holly Doremus, *Restoring Endangered Species: The Importance of Being Wild*, 23 HARV. ENVTL. L. REV. 1, 13–14 (1999); *see generally* ALDO LEOPOLD, A SAND COUNTY ALMANAC (1949).

[110] Aesthetic values are important to the American public and are a legitimate reason for protection. Our national parks are usually chosen for their extraordinary beauty. However, aesthetic appeal of a species sometimes detracts from the more important consideration of the ecological importance of a species. The pejorative nature of the phrase "charismatic megafauna" is due in part to this misplaced emphasis on aesthetics. John Charles Kunich, *Preserving the Womb of the Unknown Species with Hot Spots Legislation*, 52 HASTINGS L.J. 1149, 1196 (2001).

[111] J. B. Ruhl, *Sustainable Development: A Five-Dimensional Algorithm for Environmental Law*, 18 STAN. ENVTL. L.J. 31, 35 n.10 (1999).

[112] There is considerable controversy as to whether the ESA has had any significant economic effect in logging communities. At least one study attempted, but failed, to find robust inverse relationships between timber employment and various measures of poverty in California logging counties. The expected inverse relationships between timber employment and poverty indicators were swamped by relationships between local and state-level poverty indicators. Peter Berck et al., Poverty and Employment in Timber-Dependent Counties (Resources for the Future, Discussion Paper 00-52, Nov. 2000), *available at* http://www.rff.org/disc_papers/PDF_files/0052.pdf.

for child and spousal abuse in logging communities.[113] The opponents of the ESA have held up the most sympathetic landowners affected by ESA restrictions, including individual ranchers, farmers, and contract loggers, as paragons of American individualism being tyrannized by an oppressive regulatory state.[114] In parading these individuals before the American public, opponents of the ESA (and of environmental regulation generally) have characterized the ESA as a threat to the American values of rugged individualism, liberty, and frontiersmanship.[115] In effect, these individuals have served as the charismatic megafauna for opponents of the ESA. Opponents of the ESA also point to ESA protection of some less appealing endangered species as examples of a law that subjugates the needs of people to seemingly trivial species such as the northern spotted owl, the Red Hills salamander, and the Delhi-Sands flower-loving fly.[116]

B. The Legislative Challenge to ESA

The collision of proponents and opponents of the ESA has resulted in a heated political controversy. This controversy has occurred in numerous political, legislative, and legal strategies in an effort to jockey for both Congressional and judicial support and to sway public opinion in their favor. Several amendments were proposed in Congress to amend the ESA, most of which would have curtailed the regulatory authority of the Service.[117] In 1995, a Congressional "Endangered Species Task Force"

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> That preservation has wreaked incomprehensible havoc on timber families who have had to live with prolonged uncertainty about their futures. All indices of human despair have gone through the roof in these communities: child abuse, spousal abuse, alcohol and substance abuse, divorce, adolescent depression and suicide attempts, bankruptcies, and illness. All of these have been exacerbated by the terrible and unintended consequences of the Endangered Species Act of 1973.

138 CONG. REC. 31,856 (1992) (statement of Sen. Gorton).

[114] A recent ESA controversy involves protections for the endangered suckerfish, a bottom-dwelling fish native to a lake in southeastern Oregon. The federal refusal to allow water withdrawals for irrigation has prompted a rebellion, with local residents forcibly opening water gates and the local sheriff refusing to take action to prevent it. *See* Jehl, *supra* note 77, at A1; Douglas Jehl, *Farmers Force Open Canal in Fight with U.S. Over Water*, N.Y. TIMES, July 6, 2001, at A10.

[115] Albert Gidari, *The Economy of Nature, Private Property and the Endangered Species Act*, 6 FORDHAM ENVTL. L.J. 661, 687 (1995) (noting that the "Economy of Nature prefers economic harm to humans over environmental harm to wildlife, however indirect, caused by human activities. If it becomes the law, the fundamental building blocks of our representative democracy will be imperiled. Property rights protect liberty.").

[116] President George H. W. Bush campaigned in 1992 on a platform of reforming the ESA, stating that "[i]t's time to put people ahead of owls." Michael Wines, *Bush, in Far West, Sides With Loggers*, N.Y. TIMES, Sept. 15, 1992, at A25.

[117] For example: H.R. 2253, 104th Cong. §19(a) (1995), sponsored by Rep. Robert Underwood (D-Guam), would have required the establishment of Community Advisory

convened to hold a series of hearings throughout the country to increase popular opposition to the ESA.[118] Representative Richard Pombo, who chaired the task force, testified before his Congressional committee regarding the diminution in value of his own family's ranch caused by the designation of "critical habitat"[119] of the San Joaquin kit fox.[120] His heart-rending story ignored the fact that critical habitat for the San Joaquin kit fox had not been designated.

None of the proposed amendments to the ESA were successful, but it would be a mistake to conclude that the opponents of the ESA were merely posturing. In 1995, Congress imposed a six-month moratorium on spending any money to list new species under the ESA, effectively forbidding the Service from listing any new species.[121] Thus, Congress managed to limit, at least temporarily, the authority of the Service in its administration of the ESA and reminded the Service of the political vulnerability of the ESA.

Boards for proposed designation of critical habitat or a National Wildlife Refuge. The Service would have been required to consult the Community Advisory Board before designating an area as critical habitat or a National Wildlife Refuge. *Id.* H.R. 1714, 104th Cong. § 2(a) (1995), sponsored by Rep. Calvin Dooley (D-Cal.), would have required the Service to conduct an annual review of listed species to determine if delisting was warranted. H.R. 2364, 104th Cong. § 4(b) (1995), sponsored by Rep. John Shadegg (R-Ariz.), would have replaced "no-take" provisions with voluntary participation plans. It also would have required the decision to list to be based "solely on the basis of independently verifiable data sufficient to reach a scientific conclusion, having that data verified by field testing to the extent practical." *Id.* § 5(b)(1)(A). H.R. 1490, 103d Cong. §101 (1993), sponsored by Rep. Billy Tauzin (R-La.), would have required an external peer review before the listing of any new species. It also would have required an economic impact statement in the designating of critical habitat, and limited the citizen suit provision only to those who "[sustain] actual or imminent economic injury as a direct or indirect result of a violation of this Act." *Id.* § 504. S. 768, 104th Cong. §§ 15, 402 (1995), sponsored by Sen. Slade Gorton (R-Wash.), would have required peer-reviewed research to be the basis for listing, excluded the alteration of habitat from the definition of "take," and limited the citizen suit provision to those who suffer an "imminent economic injury." S. 1152, 104th Cong. § 3 (1995), introduced by Sen. Conrad Burns (R-Mont.), would have exempted any state or federal wildlife management activities from the ESA unless "such activity or project actually wounds or kills an endangered or threatened species."

[118] Newspaper accounts of the hearings indicate that they are more like pep rallies. *See, e.g.*, David Horsey, *Greens on the Run: GOP Wave Threatens Environmental Regulations*, SEATTLE POST-INTELLIGENCER, Nov. 5, 1995, at E1; Nancy Vogel, *Environmental Law Attacked—Foes Rip Endangered Species Act*, SACRAMENTO BEE, Apr. 29, 1995, at A1.

[119] "Critical habitat" is a designation made by the Service to protect the habitat of listed species, and is defined as those areas that are "essential to the continued existence of the species." 16 U.S.C. § 1539 (j)(2)(C)(ii) (1999). A critical habitat designation severely limits development of land within the critical habitat.

[120] *Endangered Species Act Amendments of 1993: Hearing on S. 921 Before the Subcomm. on Clean Water, Fisheries, & Wildlife of the Sen. Comm. on Env't & Pub. Works*, 103d Cong. 126 (1994) (statement of Richard Pombo), *available at* 1994 WL 14190418.

[121] *See* Omnibus Consolidated Rescissions and Approriations Act of 1996, Pub. L. No. 104-134, 110 Stat. 1321, 1321-159 to 1321-160.

C. The Judicial Challenge to the ESA

In addition to potential legislative amendment, the ESA also faced another, potentially even greater danger: a challenge through the federal courts. While a number of recent decisions have eased fears that the ESA is in immediate legal jeopardy,[122] the picture was considerably different in the early and mid-1990s. Regulatory takings litigation[123] had taken on a heightened significance.[124] Property rights advocates were not entirely satisfied but still encouraged by the Supreme Court's decisions in *Lucas v. South Carolina Coastal Council*[125] and *Dolan v. City of Tigard*,[126] which expanded, even if slightly, the instances under which plaintiff landowners could recover under regulatory takings theory.[127]

In 1996, regulatory takings theory was applied to an ESA case for the first time. Financier Charles Hurwitz, the owner of a California logging company, sued the Service for a regulatory taking, citing proposed logging restrictions to protect the habitat of the northern spotted owl and claiming that the restrictions amounted to a regulatory taking of his property.[128] The lawsuit was stayed pending the consummation of an agreement to purchase the land from the logging company, the Pacific Lumber Company, and ultimately was settled upon the actual purchase of the land with the Service's approval of an HCP covering all timber lands owned by Pacific Lumber.[129] While some legal scholars have argued that

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[122] *See, e.g.*, Gibbs v. Babbitt, 214 F.3d 483 (4th Cir. 2000). In *Gibbs*, the ESA survived a Commerce Clause challenge to the authority of the Service to regulate the taking of red wolves that had been reintroduced into native territories in North Carolina, despite the lack of any obvious interstate commerce activity. *Id.* at 493. Legal commentators watched this case closely because it occurred in what is considered to be one of the circuit courts most hostile to environmental regulation.

[123] The pertinent language of the Fifth Amendment to the U.S. Constitution reads: "nor shall private property be taken for public use, without just compensation." U.S. CONST. amend. V. In recent years, the Supreme Court has become interested in the extent to which land use regulations can be so onerous as to amount to takings. *See, e.g.*, Lucas v. S.C. Coastal Council, 505 U.S. 1003 (1992); Dolan v. City of Tigard, 512 U.S. 374 (1994).

[124] William Inden, *Compensation Legislation: Private Property Rights vs. Public Benefits*, 5 DICK. J. ENVTL. L. & POL'Y 119, 121 (1996) (noting that the "stakes are high. Most observers agree that the fight in the property rights arena is likely to determine the direction of the nation's land use policy for the foreseeable future.").

[125] 505 U.S. 1003 (1992) (holding that an aggrieved landowner must prove that the regulation deprived her of "all economically beneficial uses" of her property in order to prevail on a "regulatory takings" theory).

[126] 512 U.S. 374 (1994).

[127] Susan Rose-Ackerman & Jim Rossi, *Disentangling Deregulatory Takings*, 86 VA. L. REV. 1435, 1445–46 (2000).

[128] *See Lucas*, 505 U.S. at 1019.

[129] Hurwitz is the chairman of the Houston-based parent company, Maxxam, which owns the Pacific Lumber Company, which owned the property in question, a 10,000-acre area known as the Headwaters Forest, one of the last remaining tracts of virgin old growth forest. Ultimately, a combination of state and federal money totaling almost $500 million was paid to Hurwitz for the tract. Paul Rogers, *Deal Saves Ancient Trees—Papers Were Filed Two Minutes Before Midnight Deadline*, SAN JOSE MERCURY NEWS, Mar. 2, 1999, at 1A.

the ESA is a "background principle of law"[130] that could survive a regulatory takings claim,[131] it is not clear that the Supreme Court would have been unsympathetic to Hurwitz's claim.[132]

From the point of view of the Service, there existed constraints upon its ability to impose land use restrictions to protect listed species under the ESA. Any onerous land use restriction had the potential to induce a legal challenge from a landowner or a property rights advocacy group, which, if successful, could have divested a substantial amount of regulatory authority from the Service. Even a case limited to a particularly bad set of facts could have set a precedent that would have constrained the Service's administration of the ESA. The threats of judicial challenge, when considered with the threats of a legislative challenge, posed a formidable problem for the Service.

D. Habitat Conservation Planning

1. Implementing HCPs

In this political and judicial maelstrom, Secretary of the Interior Bruce Babbitt and Interior Solicitor Joseph Sax sought to extend an olive branch to landowners who faced or potentially faced land use restrictions under the ESA.[133] The olive branch was the use of the previously little-used HCPs to grant landowners some flexibility in complying with the ESA.[134] While HCPs were created by an amendment to the ESA in 1982,[135] they were dormant until the 1990s, when Babbitt and Sax sensed the urgency of making the ESA less threatening to landowners and quickly increased implementation of HCPs. While the Service only approved three HCPs from 1982 to 1989, it approved twenty-two from 1990

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[130] A critical part of the *Lucas* ruling is that a takings claim cannot succeed against a regulation that curtails a common-law nuisance (such as a factory billowing out noxious fumes next to a residential area) or a regulation that is otherwise a well-established "background principle of law." *Lucas*, 505 U.S. at 1029.

[131] Oliver A. Houck, *Why Do We Protect Endangered Species, and What Does That Say About Whether Restrictions on Private Property to Protect Them Constitute "Takings"?*, 80 IOWA L. REV. 297, 306 (1995); *see* Robert Meltz, *Where the Wild Things Are: The Endangered Species Act and Private Property*, 24 ENVTL. L. 369, 408–09 (1994).

[132] "The Court's holding that the hunting and killing prohibition incidentally preserves habitat on private lands imposes unfairness to the point of financial ruin—not just upon the rich, but upon the simplest farmer who finds his land conscripted to national zoological use." Babbit v. Sweet Home Chapter of Cmtys. for a Greater Or., 515 U.S. 687, 714 (1995) (Scalia, J., dissenting).

[133] Joseph L. Sax, *Environmental Law at the Turn of the Century: A Reportorial Fragment of Contemporary History*, 88 CAL. L. REV. 2375, 2380–81 (2000).

[134] *See id.*

[135] Endangered Species Act Amendments of 1982, Pub. L. No. 97-304, §§ 6(1)–(4)(A), (5), (6), 96 Stat. 1422–24 (1982) (codified as amended at 16 U.S.C. § 1539(a) (1994 & Supp. V 1999)).

to 1993 and 193 from 1994 to 1997.[136] Currently, 379 HCPs are in effect throughout the United States.[137]

As described briefly above, an HCP sets forth a schedule of mitigation measures a landowner is required to undertake to aid rare and sensitive species[138] in exchange for qualified immunity from ESA liability. Both the Service, as guardian of endangered or threatened fish and wildlife, and the landowner would benefit from this exchange of obligations. In addition to serving as a trading mechanism, however, HCPs serve as a vehicle for negotiations between the Service and the landowner in what is essentially a property rights dispute. The Service and the landowner have competing claims to the landowner's property. The Service seeks to impose ESA restrictions on the landowner's property to protect endangered and threatened species, and the landowner seeks to use her property in ways that preclude the use of the property as habitat for endangered and threatened species.

2. *Benefits from HCPs*

a. *Compromising the Service's Regulatory Authority*

If the Service imposes ESA restrictions on the landowner's property, the landowner may resort to litigation to challenge the Service's restrictions. This possibility gives rise to uncertainty for both the Service and the landowner. The Service faces the threat of litigation as a challenge to its authority to regulate the property, and the landowner faces the threat that her challenge (if she undertakes one) will be unsuccessful and that she will face ESA land use restrictions aimed at protecting endangered or threatened species. HCPs effectuate a compromise regarding the extent to which the landowner will be restricted in her use of her property, given the potential ESA restrictions that might be imposed. An HCP thus serves as an instrument for negotiating a settlement agreement.

A landowner challenge in the form of a regulatory takings lawsuit could also affect the Service's regulatory authority and thus have implications well beyond the landowner's property. This was no doubt an important consideration faced by the Service in handling the Hurwitz lawsuit.[139] A successful challenge to ESA restrictions based on a regulatory takings theory, which would require the payment of just compensation

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[136] Hsu, *supra* note 10, at 10,594.

[137] U.S. Fish and Wildlife Service, *Endangered Species Habitat Conservation Planning*, *at* http://endangered.fws.gov/hcp/ (last modified Nov. 16, 2001) (on file with the Harvard Environmental Law Review).

[138] Thus, an HCP protects species formally listed as endangered and threatened and also species that the Service believes is vulnerable to future listing or that could colonize habitat in or near the HCP area.

[139] *See supra* note 129 and accompanying text.

from the Service to the landowner, would significantly constrain the Service's future ability to regulate land use to protect listed species. In that sense, the Service may often have more at stake than a landowner in such a property rights dispute.

The Service also faces a general challenge to its regulatory authority when property rights advocates lobby for legislative amendments to the ESA that would curb the Service's regulatory authority, which was a common occurrence during the 104th Congress.[140] The amendments to the ESA proposed during that Congress would have severely constrained the ability of the Service in regulating to protect listed species. The HCP program, as conceived and developed by Babbitt and Sax, served as a broad compromise over the scope of regulation that the Service would exercise in carrying out its administration of the ESA. Under the HCP program, the Service attempted to prevent restrictions upon its authority by offering to compromise[141] with landowners.[142]

The Service thus faced threats to its regulatory authority on two levels. On a local level, ESA land use restrictions imposed by the Service but specific to a property were subject to judicial challenge by the landowner and could be nullified through litigation. On a national level, the Service's regulatory authority was subject to challenge either through litigation or amendment of the ESA. Both of these types of threats were addressed by the HCP program, albeit in different ways. At the local level, an individual HCP served as a compromise with respect to a specific property, defusing the need for litigation to settle a property rights dispute. At the national level, the HCP program served as a compromise with respect to the Service's ambitions of regulating land use. HCPs also provided landowners with some regulatory certainty by clearly and definitively setting forth their obligations with respect to the ESA.

b. Information Sharing

HCPs also have a number of other benefits. They create some opportunities in which the Service and the landowner share information. For example, as part of an HCP the Service often secures permission from the landowner to access the landowner's property in order to monitor and study sensitive species.[143] The Service may grant the landowner some concession for such permission, such as it did to developers building in the habitat of the endangered Alabama beach mouse.[144] This ex-

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[140] *See supra* note 117 and accompanying text.

[141] Robert Reinhold, *Tiny Songbird Poses Big Test of U.S. Environmental Policy*, N.Y. TIMES, Mar. 16, 1993, at A1.

[142] Sax, *supra* note 133, at 2381–82.

[143] Hsu, *supra* note 10, at 10,599.

[144] *Id.*

change is one in which both the Service and the landowner may make themselves better off. Also, because HCPs offer at least as much of a legitimacy benefit produced by negotiated rulemakings, HCPs possibly lead to greater compliance.[145]

c. Possible Improved Enforcement on Private Property

HCPs also address, albeit incompletely, the "Achilles heel" of the ESA: regulation of behavior on private property.[146] Even proponents of the ESA acknowledge deficiencies in the ESA as it relates to private land.[147] And yet with half of all species listed under the ESA having at least eighty-one percent of their habitat on private land,[148] the ESA is woefully inadequate for regulating most private behavior that affects listed species. As a practical matter, the Service, with its limited resources, is powerless to stop most actions on private land that would be prohibited under the ESA. Landowners often degrade habitat, and possibly even kill endangered or threatened species, before the Service is even aware of the presence of species, giving rise to the phrase "shoot, shovel, and shut up" ("SSSU").[149] Though there are numerous accounts of these types of occurrences, the frequency of such conduct cannot be quantified empirically. Suffice it to say, the abundance of anecdotes relating to such occurrences indicates that this could be a serious problem confronting the Service.[150]

In other cases, when landowners become aware of the prospective listing of a species that may affect their property, they may legally preempt future ESA restrictions by degrading their property so that it ceases to be habitat.[151] Absent a critical habitat designation,[152] landowners may

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[145] *See* Freeman & Langbein, *supra* note 22, at 69–70.

[146] *See* Sheldon, *supra* note 50, at 283–84.

[147] David S. Wilcove et al., *Rebuilding the Ark: Toward a More Effective Endangered Species Act for Private Land*, ENVTL. DEF. FUND, 1996, at 3.

[148] *Id.*

[149] Mike Vivoli, *Shoot and Shovel, and Shut Up*, WASH. TIMES, Nov. 27, 1992, at F2.

[150] Sheldon, *supra* note 50, at 281 n.10. Obviously, there are no reliable estimates of how prevalent this practice is, but stories of ranchers quietly running over grizzly cubs and loggers shooting northern spotted owls abound. *See, e.g.*, Charles McCoy, *Sail-By Shootings Become a Problem in Monterey Bay—Sea Lions are Among Victims of the Spiteful Violence Protectionism Has Spurred*, WALL ST. J., Sept. 2, 1994, at A1; John J. Fialka, *Endangered Species Act, Itself Endangered, May Have Found the Political Backing to Survive*, WALL ST. J., Mar. 2, 1998, at A20; Craig R. Baldauf, *Searching for a Place to Call Home: Courts, Congress, and Common Killers Conspire to Drive Endangered Species into Extinction*, 30 WAKE FOREST L. REV. 847, 847 (1995).

[151] In the days immediately preceding the listing of the California coastal gnatcatcher, there were reports of "midnight bulldozing" by landowners who wished to avoid the imminent ESA restrictions. Maria Newman & Eric Bailey, *Bulldozers Have Been Busy During Gnatcatcher Debate*, L.A. TIMES, Aug. 1, 1991, at 1. Also, just prior to its listing, one of three known populations of the San Diego Mesa mint was destroyed by a developer, again in order to avoid ESA restrictions. Charles Mann & Mark Plummer, *Is the Endangered Species Act in Danger?*, 267 SCIENCE 1256, 1258 (1995).

[152] The "critical habitat" of a species must be designated at the time of listing "to the

even degrade quality habitat of a listed species if there is no indication that the species has colonized the landowner's property to prevent future colonization with attendant ESA restrictions. Consider the example of a timber harvesting company in the Northwest that holds a vast amount of the old-growth forest that is prime habitat for the northern spotted owl but is not currently occupied by owls. The company has an incentive to extract the timber before it is colonized by owls and becomes subject to ESA restrictions. Accelerating the harvest is not economically optimal or even profitable to the company because it disrupts the cash flow of such an enterprise. But if such a company does not increase its harvest now, its only alternative might be to abandon the timber indefinitely if it became colonized by a northern spotted owl (a fairly common occurrence). Thus, the company may harvest immediately to salvage some timber from the land and avoid the imposition of ESA restrictions.

This type of quandary provided the impetus for the development and implementation of an HCP for a North Carolina landowner who previously managed his timberlands in a manner that was conducive to colonization by the endangered red-cockaded woodpecker.[153] After the landowner threatened to cease managing his property in such a manner,[154] the Service negotiated and successfully consummated an HCP with the landowner. The Service reasoned that there was nothing to be lost by agreeing to an HCP because some prime red-cockaded woodpecker habitat might be lost without the HCP. By agreeing to an HCP, the landowner saved himself the expense of this costly preemption practice and some psychological benefit from the ability to manage his property in an ecologically beneficial manner.

Thus, HCPs ameliorate both the Service's enforcement problem in detecting illegal SSSU actions and the landowner preemption problem by offering landowners an alternative to destructive and wasteful land use practices. HCPs, if expeditious enough, allow the Service to offer some reward to landowners for conservation despite strong incentives for the

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maximum extent prudent and determinable." 16 U.S.C. § 1533(a)(3)(A) (1994 & Supp. V 1999).

[153] Memorandum from Assistant Regional Director, U.S. Fish & Wildlife Serv., Atlanta, Ga., to Deputy Director, U.S. Fish & Wildlife Serv., Atlanta, Ga., Findings and Recommendations on Application Submitted by Mr. Ben Cone, Jr., for Incidental Take Permit for the Red-cockaded Woodpecker on his Properties Called Cone's Folly and the Long Ridge Tract, Pender County, North Carolina 1–2 (Oct. 2, 1996) (on file with the Harvard Environmental Law Review) [hereinafter Cone Memorandum].

[154] The property actually contained twenty-nine woodpecker colonies, but the landowner could have isolated the colonies by failing to manage those areas not colonized by the woodpeckers. Such an action would have been perfectly legal, and would eventually have led to the loss of the woodpeckers. *See* Cone Memorandum, *supra* note 153, at 1; U.S. Fish & Wildlife Serv., Final Environmental Assessment for the Issuance of an Incidental Take Permit to Mr. Ben Cone, Jr., in Pender County, North Carolina 1 (1996) (on file with the Harvard Environmental Law Review).

landowner to do otherwise. HCPs give landowners less reason to fear prospective ESA restrictions.[155]

3. Results

Judging from the results, the Secretary and the Solicitor were at least successful in their attempt to save the ESA and engage landowners in a less adversarial relationship. While anti-ESA sentiment and anti-ESA proposals reached a feverish pitch in the mid-1990s, they have since decreased substantially, and the ESA is no longer in imminent danger of repeal. As for its effect on the SSSU problems and the landowner preemption problems, empirical evidence does not exist to demonstrate that HCPs have helped, although it is highly unlikely that they have exacerbated the problem.

On the downside, substantial questions exist as to whether the Service has faithfully adhered to the legal standards that constrain its negotiating authority in the HCP process.[156] While few landowners have sued the Service to challenge its regulatory authority,[157] environmental organizations have sued the Service for issuing incidental take permits that allegedly concede too much to landowners and fail to adequately provide

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[155] In addition to HCPs, the Service has also established a number of other policies intending to supplement HCPs to further decrease the threat of ESA to landowners. For example, the "No Surprises" policy provides that with respect to any species adequately covered by an HCP, the Service may grant an assurance that if the permittee fully complies with the terms of the HCP, the Service will not require the permittee to undertake any further mitigation measures deemed necessary in the future, even when "unforeseen circumstances" arise. Habitat Conservation Plan Assurances ("No Surprises") Rule, 63 Fed. Reg. 8,859, 8,868 (Feb. 23, 1998) (to be codified at 50 C.F.R. pts. 17, 222). No Surprises represents a greater level of protection for landowners because it eliminates the possibility of the Service imposing further mitigation measures in the future due to, for example, a determination that a species' habitat needs are greater than previously thought or migration of a previously absent listed species onto the landowner's property. The Service has also incorporated into the HCP process the "Safe Harbor" policy, which protects landowners from future ESA regulation if they initially practice land management in such a way that is beneficial to listed species, including land management practices that result in endangered or threatened species colonizing their property. The Service has also implemented Candidate Conservation Agreements, which, like the Safe Harbor policy, protect landowners from future ESA regulation if their species-friendly land management practices benefit unlisted species that are candidates for listing. *See* Jean O. Melious & Robert D. Thornton, *Contractual Ecosystem Management Under the Endangered Species Act: Can Federal Agencies Make Enforceable Commitments?*, 26 ECOLOGY L.Q. 489, 502–03 (1999).

[156] *See* Farber, *supra* note 58, at 308 (noting that a "revealing" assertion in a passage of one HCP remarked "that the negotiated agreement will be 'in lieu of the normal Endangered Species Act regulations'").

[157] The notable cases include *Gibbs v. Babbitt*, 214 F.3d 483 (4th Cir. 2000), discussed *supra* note 122, which challenged the Commerce Clause jurisdiction of the Service to prohibit the killing of endangered species; *Good v. United States*, 189 F.3d 1355 (Fed. Cir. 1999), in which a developer filed a regulatory takings lawsuit over ESA restrictions; and Charles Hurwitz's lawsuit that led to the $500 million buyout of his Headwaters tract. *See supra* note 129.

for species recovery.[158] All four of the cases brought by environmental organizations, at least in part, depend upon whether it was arbitrary and capricious[159] for the Service to issue an incidental take permit, in light of the evidence of harm accruing to the species. The Service lost two out of the four cases.[160] While the lawsuits do not prove that the Service is neglecting the needs of species, they raise a substantial concern that the Service is being overly generous towards landowners.

There are also limits as to how much the Service can demand from landowners who may simply eschew the HCP process altogether. Despite the ambiguity of the Section 9 no-take prohibition, landowners familiar with what the Service is likely to scrutinize could plan their land uses so as to avoid activities that would trigger Service scrutiny. Developers familiar with Service policy and habitat requirements could alter their projects to minimize the risk that the Service would deem their activities as potentially constituting a Section 9 take. This process has been dubbed "self-permitting," and it occurs when a developer essentially self-insures against ESA violations, rather than developing an HCP and effectively purchasing the insurance policy offered by the Service.[161] The possibility of landowners opting out of negotiations in this manner renders HCPs less useful as a mechanism for engaging landowners in a cooperative arrangement.[162]

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[158] *See, e.g.*, Loggerhead Turtle v. County Council of Volusia County, 120 F. Supp. 2d 1005 (M.D. Fla. 2000); Nat'l Wildlife Fed'n v. Babbitt, 128 F. Supp. 2d 1274 (E.D. Cal. 2000); Sierra Club v. Babbitt, 15 F. Supp. 2d 1274 (S.D. Ala. 1998); Friends of Endangered Species v. Jantzen, 760 F.2d 976 (9th Cir. 1985).

[159] This is the applicable standard of review under the terms of the APA. *See* 5 U.S.C.A. § 706 n.32 (2000) (noting that the "arbitrary and capricious" standard applies to the APA).

[160] The Service lost in *Nat'l Wildlife Fed'n v. Babbitt*, 128 F. Supp. 2d. 1274 (E.D. Cal. 2000), and *Sierra Club v. Babbitt*, 15 F. Supp. 2d 1274 (S.D. Ala. 1998).

[161] *See* J. B. Ruhl, *How to Kill Endangered Species, Legally: The Nuts and Bolts of Endangered Species Act "HCP" Permits for Real Estate Development*, 5 ENVTL. LAW. 345, 363–64.

[162] The Service has also attempted, however, to draw landowners into the HCP process by drawing other federal agencies into the process, thereby triggering Section 7 consultation requirements. *See supra* note 95 and accompanying text. Section 7 requires that federal agencies consult with the Service to make sure that no federal actions are likely to jeopardize the continued existence of a listed species. 16 U.S.C. § 1536(a)(2) (1994). For example, the Service has taken the position that the issuance of a storm water permit for general construction activity under the National Pollution Discharge Elimination System ("NPDES") under the Clean Water Act constitutes a federal action that triggers Section 7 obligations, including the requirement that EPA consult with the Service. *Id.* § 1536(a)(1)–(2). Because EPA must ultimately approve the storm water permit, it must ensure that approval of the permit must not jeopardize the continued existence of listed species. Thus, the Service has another means of reaching the developer by using the EPA as a regulatory conduit and denying developers the option of self-permitting. Ruhl, *supra* note 161, at 370.

4. Necessary Modifications

Not all of the problems with HCPs are immediately solvable, but some improvements are clearly in order. A clarification (preferably a statutory one) of the phrase "appreciably reduce the likelihood of survival of species in the wild" is necessary to delineate what the Service can and cannot do in negotiating HCPs.[163] In negotiating an HCP, there should be at least as much habitat of equivalent quality after the HCP to prevent detriment to listed species. Although off-site acquisition of habitat has been a popular mitigation measure for permittees, much more could be done to contribute to the recovery of sensitive species.[164] Standards should ensure that the habitat acquired is not land already owned by the federal government or land that was reasonably susceptible to federal acquisition.[165]

Another constraint that should be imposed is that the net effect of the HCP should be an increase in the number and health of populations. The Service has used HCPs to abandon certain populations of listed species in exchange for measures to shore up the health of other populations.[166] While this may not offend the goals of the ESA, clearer standards are needed to ensure that the Service does not abandon viable populations in exchange for measures that may or may not help other populations. Standards should specify the conditions under which the Service may authorize an incidental take that will likely lead to the loss

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[163] 16 U.S.C. § 1539(a)(2)(B)(iv).

[164] The Service has sometimes asked for very modest mitigation measures under HCPs. Some HCPs for the red-cockaded woodpecker have merely required the logging company to pay for costs to capture the woodpeckers and transport them onto federal lands where trees have been prepared for colonization by drilling cavities. *See* Wilcove et al., *supra* note 147, at 11. In such cases, there is no acquisition of habitat—the new woodpecker habitat is on land already owned by the federal government. *See id.* The logging company is thus given the right to clear-cut some woodpecker habitat for the modest cost of transporting the woodpeckers to a new home. This was the case for the Red Oak Timber Company of Louisiana, which purchased a 1016-acre tract of forestland that was habitat for two groups of red-cockaded woodpeckers. *Id.* Red Oak logged all but 137 acres of the land inhabited by the woodpeckers, then sought an incidental take permit to log the rest. The Service agreed. *Id.*

[165] In an HCP, the Red Oak Timber Company, for example, was merely required to move the woodpeckers on its property to a nearby military base, where artificial nesting cavities were drilled for the woodpeckers. The total cost of these mitigation measures was $8,800, approximately the amount of proceeds from the timber from five or six acres of the property. *Id.* The Service can acquire land "to conserve fish, wildlife, plants, including those which are listed as endangered species or threatened species" by acquiring land or waters "by purchase, donation, or otherwise." 16 U.S.C. § 1534(a)(2). The funding mechanism is derived from the Land and Water Conservation Fund Act of 1965, Pub. L. No. 88-578, 78 Stat. 897 (1964) (codified as amended at 16 U.S.C. §§ 4601–4605 (1994)). Both the House and the Senate voted to fully fund the Land and Water Conservation Fund in 1999, but the bills were not signed into law. H.R. 4377, 106th Cong. (2000); S. 2181, 106th Cong. (2000).

[166] Hsu, *supra* note 10, at 10,600.

of a population. Some minimum viable population analysis should be a part of the HCP process.

Both of these types of constraints should help establish the baseline from which the Service should be considered to be bargaining. That is, both the Service and the landowner should be aware of the default rule in case negotiations fail and there is no HCP. Too often, the Service has unnecessarily modest expectations of what it can accomplish, and it seeks assistance from permittees when it should be requiring permittees to undertake other and more valuable mitigation measures.[167] Standards must specify acceptable mitigation measures to ensure that the Service does not use HCPs as a mechanism to collect funding that Congress should have provided. Standards must also specify that the Service does not use HCPs to have permittees perform actions that the Service is lawfully required to undertake.

For landowners, greater certainty is necessary in defining the phrase "[to] the maximum extent practicable, minimize and mitigate the impacts of such taking."[168] Negotiating terms of the landowner's obligations to mitigate and minimize impact have been unnecessarily subjective, resulting in the potential for treating applicants differently.[169] It is undesirable that such a phrase can result in many differing interpretations in the HCP program, none of which are acceptable to the Service as a general rule. HCP negotiations should be reasonably consistent among applicants.

Drafting a set of standards that would be included in a statutory or regulatory clarification constraining the Service's authority in negotiating HCPs is beyond the scope of this Article. The need for this effort, however, is clear.

VI. Application of a Game-Theoretic Model to the HCP Process

A. Introduction to Game Theory

The various political and legal pressures on regulatory agencies and the agencies' adoption of reinvention as a regulatory strategy make regu-

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[167] In protecting the red-cockaded woodpecker, the Service did not need a permittee to facilitate management of federal lands under the jurisdiction of the Department of Defense. The Service could have drilled the cavities themselves and required the Red Oak Timber Company to acquire private lands elsewhere to compensate for the loss of habitat by logging.

[168] 16 U.S.C. § 1539(a)(2)(B)(ii).

[169] The reality is often that a relatively small group of lawyers and consultants representing landowners are widely familiar with the terms of all the HCPs to which the Service has previously agreed, making it difficult for the Service to treat applicants differently or unfairly. I am particularly indebted to J. B. Ruhl on this point. Professor Ruhl's role in negotiating many of the original HCPs has lent this Article insights that would otherwise be unavailable from any source.

latory agencies a suitable subject for economic game-theoretic modeling. Game-theoretic economic models are of particular use when the actions of some actors are highly dependent upon the actions, anticipated or actual, of other actors.[170]

A central argument of this Article is that the negotiation-based strategy of regulatory agencies is directly related to the threats and actions of regulated parties. The threat of litigation by regulated parties or of a legislative attack on the underlying statute has almost certainly induced agencies to adopt a more consensual approach to regulation. A less obvious agency motivation for entering into negotiations with regulated parties pertains to enforcement problems confronting the agency. Agencies that find themselves short of necessary resources to detect violators have instead used negotiated agreements to bring about a truce with regulated parties. Thus, the reinvention initiatives were generally aimed at avoiding the worst regulatory outcomes from the agency perspective, which were significant legislative or judicial weakening of environmental statutes and widespread noncompliance with their regulations.

Regulated parties also have formulated their strategies in the context of actions and threats of regulatory agencies. Whether a regulated party will challenge the authority of an agency may depend greatly on how the agency will react. The willingness to enter into negotiations with a regulatory agency implicitly recognizes that the agency possessed some authority to severely constrain private behavior.

Economic game theory can also help illuminate the negotiation process of reinvention projects in other ways. First, the economic concept of risk aversion almost certainly accounts in part for the willingness of both agencies and regulated parties to enter into negotiations.[171] Because they are risk averse, both agencies and regulated parties are willing to compromise to avoid the uncertainty as to whether they could obtain the most desirable outcome. Second, as in negotiated rulemaking, the process of negotiation under the rubric of reinvention could yield informational benefits to both agencies and regulated parties, which would be unavailable otherwise even if agencies or regulated parties could act with impunity.

Thus, this Article will model the regulatory negotiations characteristic of reinvention projects as a game in which compromises are struck

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[170] For a general discussion of economic game theory, see ANDREU MAS-COLELL ET AL., MICROECONOMIC THEORY 219–34 (1995).

[171] In economic terms, risk aversion is the unwillingness to take fair bets. For example, a fair bet would be an offer to double or nothing one's life savings. While the terms of the bet are fair in the economic sense, it is a bet that very few would take because they are averse to the risk of losing all of their wealth. Risk aversion is thus the driving force behind the purchase of insurance of all types. Risk aversion is also understood as the declining marginal utility of wealth, or the lower marginal utility associated with higher levels of wealth. A risk-averse individual will attempt to avoid extreme, all-or-nothing outcomes. *Id.* at 183–99.

between an agency and a regulated party. Both the agency and the regulated party face some uncertainty as to the current or future status of the law, and both are somewhat averse to risk, leading them to desire some compromise resolution. For the sake of clarity, I will focus upon habitat conservation planning under the ESA. The model and analysis presented, however, may be generalized for other types of negotiated agreements between regulatory agencies and regulated parties.

B. Modeling the HCP Process

I employ a highly simplified game-theoretic model to represent the process by which the Service and landowners agree to an HCP. The game consists of a sequence of moves by two adversarial players labeled "Regulator" and "Landowner."[172] There is also a third party, a governmental entity that adjudicates a challenge brought by the landowner against the regulator. Several simplifying assumptions are made for the sake of clarity. These assumptions are not realistic, but they do not affect the general conclusions that may be drawn from the analysis.

Assumption 1: The landowner wishes to develop as much of the property as possible.

The landowner is assumed to maximize profits. The greater portion of her land developed, the greater her profits, so profit maximization would require development of the entire property. Her original development is assumed to be a profit-maximizing one. Her original development plan uses the entire property, leaving nothing behind for the benefit of sensitive species. The landowner receives no benefit from and does not care about biological diversity. To simplify, this model assumes that some preservation of habitat would not enhance property values, the landowner would not derive utility from biological diversity, and the optimal amount of development could not be less than the entire property.[173]

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[172] Representing the Service as an advocate for endangered and threatened species is clearly a simplifying assumption. In reality, the Service, as regulator, is attempting to meet a variety of goals, including the preservation of its regulatory authority, even if it means limiting its own authority so as to avoid a possibly dangerous confrontation with regulated landowners. This has sometimes drawn criticism from environmental organizations, placing the Service in an adversarial role with environmental organizations that usually act as advocates for species. Indeed, the Service promises to defend landowners in lawsuits by environmental organizations targeting HCPs to induce landowners to enter into HCPs.

[173] If the optimal amount of development is less than the entire property, landowners might propose more extensive development than is really optimal for the purpose of creating bargaining chips. While the extent to which this actually occurs is impossible to determine, the relationships that are derived in this model exist even without this simplifying assumption.

Assumption 2: The landowner's profits from development increase linearly with the fraction of the land developed.

If the landowner completes her entire planned development, then she realizes full profits; if she carries out only half of her planned development, she receives half of her profits.

Assumption 3: Development of the property would result in loss of species habitat and would cause external social damages.

The entire property is assumed to be habitat. Preserving the entire property would preserve the status quo and would result in zero profits and zero external social damages. While maximizing the landowner's private profits requires development of the entire property, developing the entire property also maximizes the amount of external social damages.

Assumption 4: The property may be used for development or preservation as habitat, but any part that is preserved for habitat has no developmental use at all.

Thus, if the landowner completely carries out her planned development, the property is assumed not to allow for any preservation. In other words, while the fractions of the property can be divided into development and preservation, the uses are mutually exclusive for any specific piece of the property.

Assumption 5: The regulator wishes to preserve as much of the property as possible.

The regulator is assumed not to care about the landowner's profits and to care only about preserving the property as habitat. Any external social damages accruing to sensitive species are assumed to be damages suffered by the regulator. The greater the degree of preservation, the smaller the external social damages suffered by the regulator.

Assumption 6: External social damages (and by assumption, damages suffered by the regulator) increase linearly with the fraction of the property that is developed.

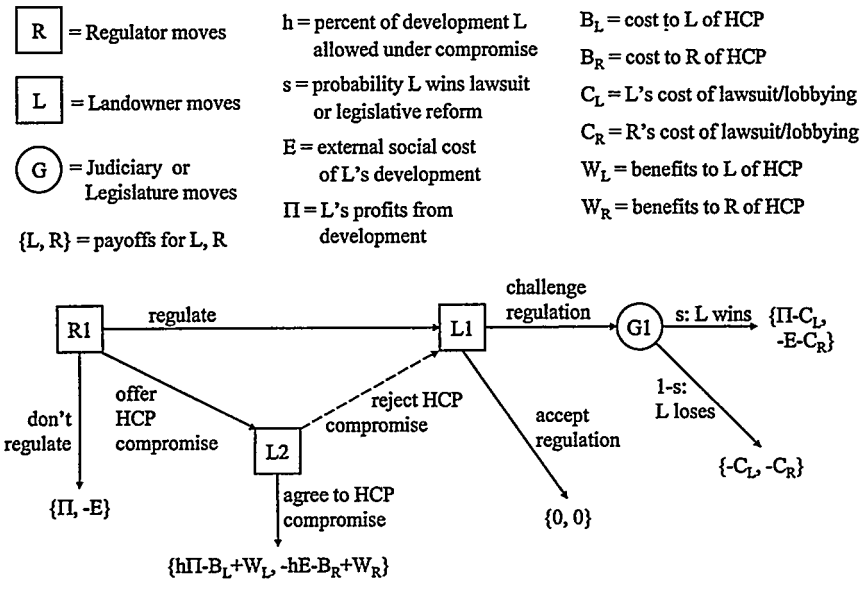
If the entire property is developed, then the regulator is assumed to suffer full damages resulting from the loss of habitat. If the entire property is preserved as habitat, then the regulator suffers no damages at all. If half of the property is developed and half is preserved, then the regulator suffers half the damages of the full-development scenario.

Assumption 7: The regulator and landowner are both assumed to be rational, and to have access to the same information regarding the outcomes of the game.

There can thus be no bluffing and no gaming, and only credible threats will be taken seriously. Both the regulator and the landowner know each other's expected payoffs in every outcome.

The player known as the regulator is denoted *R*, and the player known as the landowner is denoted *L*. The game is shown in Figure 1. A formal solution of the game is contained in the Appendix, but I will provide a brief analysis of the game to illustrate some critical points.

Figure 1. Simple HCP Model



C. The Simple HCP Game: Service Offers a Take-It-or-Leave-It HCP

The game begins in the upper left-hand corner, at node *R1*, with three choices facing *R*: (1) imposing a regulation upon *L*, (2) not imposing the regulation and allowing development to proceed, or (3) offering *L* an HCP compromise so that *L* is permitted to develop a fraction of her land that is denoted *h*.

If *R* opts not to impose the regulation at all, *L* will fully develop her property and obtain her full profits *Π*, while *R* will suffer *E*, the full ex-

ternal social damages of *L*'s development. *R*'s payoff would thus be referred to as *-E*.

If *R* offers *L* an HCP compromise and *L* accepts, then *L* only develops the fraction *h* of her land. *L* cannot make a counteroffer in this simplified game. Thus, in a compromise, *L* obtains partial profits $h\Pi$, and *R* suffers partial damages *hE* (or a payoff of *-hE*). In addition, in an HCP compromise, both sides incur costs of negotiating and developing the HCP, and both sides enjoy some benefits from the HCP, such as the informational benefits and side-agreement benefits discussed above. The costs and benefits of an HCP are denoted *B* and *W*, respectively, and are subscripted *R* and *L* to represent those attaching to the regulator and landowner, respectively. Note that in a game where the players have access to the same information regarding outcome, there is no gaming or posturing, so *L* will never reject an HCP compromise offer, because *R* will never bother offering an HCP compromise that is not at least marginally acceptable to *L*. The dotted line for *L*'s rejection of an HCP compromise offer thus denotes this latent option. If scope for compromise exists, the parties will reach a settlement. In the case of HCPs, the scope for compromise is created by the presumably lower costs of collaboration than of a challenge,[174] and the side benefits created thereby. If there is an HCP compromise, the payoffs will be as follows: for *R*, the payoff will equal $-hE - B_R + W_R$; for *L*, the payoff will equal $h\Pi - B_L + W_L$.

If *R* chooses to regulate at node *R1*, then *L* has two options at node *L1*: (1) to acquiesce in the regulation and refrain from development, or (2) to challenge the regulation and seek regulatory relief outside the regulatory agency by suing the agency or lobbying for a legislative amendment curbing the agency's authority.[175] If *L* acquiesces in regulation, payoffs are zero for both *R* and *L*—*L* obtains no profits, and *R* suffers no damages. If *L* challenges the regulation and seeks regulatory relief, a judicial or legislative body will consider *L*'s grievance (depending upon the type of relief that *L* seeks), and *L* will obtain regulatory relief with probability *s*.[176] That is, *L* will win the challenge with probability *s*,

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[174] *See infra* note 175.

[175] In the simplest case, a challenge is a lawsuit involving a single aggrieved landowner as plaintiff against a regulatory agency as defendant, and the adjudication pertains only to that landowner's property. The game involving a regulator and a landowner could also represent a broader struggle between the agency and a Congressional faction representing regulated industries with the adjudication being made by the full Congress or the federal courts. In reality, of course, there are a spectrum of complexities. The adjudication of a lawsuit also may have precedential impact upon the scope of the agency's authority. Similarly, individual regulated parties may face a collective action problem in enlisting Congressional support to champion their cause. Modeling such complexities is beyond the scope of this Article, and the general conclusions provided herein are not affected by these complexities.

[176] In a more general and heuristic sense, *s* can be thought of as the strength of *L*'s property right to develop her land. This is consistent with a more concrete conceptualization of *s* as a probability of *L* winning a lawsuit, since litigation in this context is intended

and L will lose the challenge with probability $1-s$. If L wins her challenge, she will realize her full profits, Π, and R will suffer the full external social damages, E, just as if it had never regulated in the first place.[177] The difference is that both L and R have incurred a cost of the challenge: C_L for the landowner and C_R for the regulator. If L loses her challenge, then L will realize no profits, R will suffer no damages, and it is as if R had regulated and L had not challenged. The difference is that both sides have incurred the challenge costs. If L challenges, the payoffs are as follows:

	R	L
L wins	$-E-C_R$	$\Pi-C_L$
L loses	$-C_R$	$-C_L$

This game is incomplete, however. In the game just described, any HCP compromise will inure to the maximum benefit of R, because the game allows R to make L a take-it-or-leave-it offer of an HCP compromise. L will have a breaking point, at which she is indifferent between her payoff from an HCP compromise and her expected payoffs if she challenges. Since this is a game in which both parties have the same information regarding the expected outcomes, there is no bluffing or gaming. Thus, R knows exactly L's breaking point, the point after which she will seek regulatory relief through litigation or legislation. R figures out L's breaking point by finding the least favorable HCP such that L just barely prefers the HCP to challenging the regulation. Since L is rational, she would accept the offer of an HCP, since it offers her better prospects than a challenge, if just barely. R will thus make the least generous offer possible. If there is any room for compromise, R will occupy all of it.

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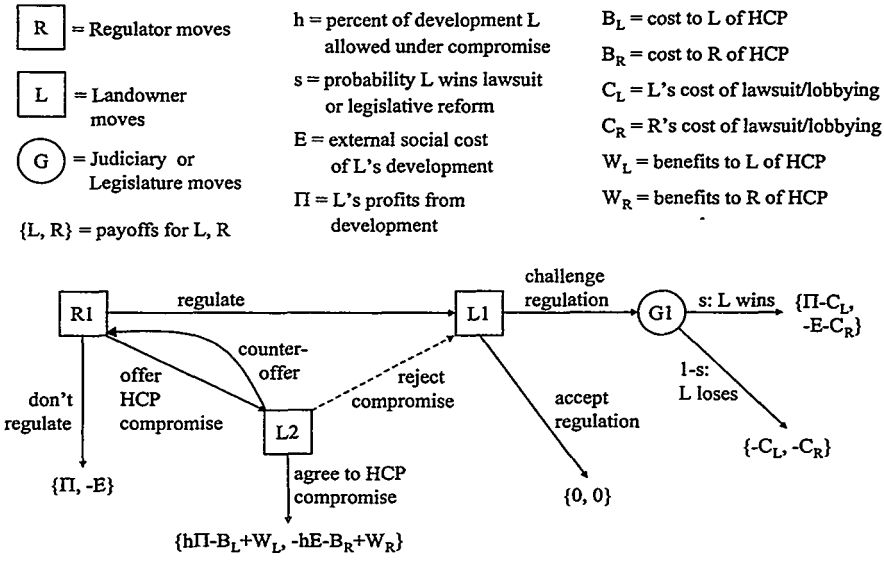
to settle a property rights dispute between the regulator and landowner. While the models in this Article present s as an exogenous variable, regulated parties and environmental organizations tirelessly attempt to change s. Regulated parties, by lobbying members of Congress, try to increase s, and environmental organizations do the same to try to decrease s. Both sides frequently participate in landmark court cases by filing amicus briefs.

[177] In fact, R's situation could be more dire than simply losing a battle over a piece of land. In reality, if R loses a lawsuit, the precedential harm to R's regulatory authority could hamper its ability to regulate many other parcels. Similarly, if R loses a legislative battle, then R is likely to have lost some regulatory authority. However, this can be incorporated into the models as a very high E, which indicates a high risk of losing. In fact, this is not so different from actual negotiations conducted with a fear of setting a disadvantageous precedent.

D. HCP Bargaining Model

In order to balance the game, *L* must be allowed to make a counter-offer after *R* makes an initial offer. This modified game is shown in Figure 2.

Figure 2. HCP Bargaining Model



This modified game differs from the game shown in Figure 1 only in the addition of an option for *L* at node *L2*. In addition to agreeing to the compromise or rejecting the compromise, *L* can now also make a counteroffer to *R*. Thus, *R* cannot make a take-it-or-leave-it offer to *L*, forcing *L* into the least favorable HCP for *L* as it did in the Simple HCP Game. In this modified game, *L*'s ability to counter-offer allows the parties to negotiate the terms of an HCP. If there is scope for a compromise in the form of an HCP, then *R* and *L* can negotiate over the extent to which *L* will be allowed to develop her property. Again, since there is no gaming or posturing, if scope for compromise exists, the parties will reach agreement.

The modified HCP Bargaining Game has the following five possible outcomes and corresponding payoffs:

Outcome 1: R *does not regulate the property, and* L *completely develops the property. Payoff for* R = -E

Payoff for L = Π

Outcome 2: R *offers an HCP compromise, and after negotiation,* R *and* L *agree to an HCP.*
Payoff for R = $-hE - B_R + W_R$
Payoff for L = $h\Pi - B_L + W_L$

*Outcome 3:*R *regulates the property in preserving the entire property as habitat, and* L *acquiesces.*
Payoff for R = *0*
Payoff for L = *0*

*Outcome 4:*R *regulates the property, and* L *challenges the regulation and loses.*
Payoff for R = $-C_R$
Payoff for L = $-C_L$

*Outcome 5:*R *regulates the property, and* L *challenges the regulation and wins.*
Payoff for R = $-E - C_R$
Payoff for L = $\Pi - C_L$

Within the context of habitat conservation planning under the ESA, Outcome 4 and Outcome 5 are rarely observed because few challenges to the ESA and the Service's regulatory authority have been levied subsequent to Babbitt's rehabilitation of HCPs. The vast number of HCPs and the relatively few instances of litigation[178] suggest that there usually exists scope for compromise between the Service and landowners. This should not be a surprising result; although the costs of developing an HCP can be high, they are typically much less than the costs of challenging regulation through litigation or lobbying. Thus, in practice, only Outcome 1, Outcome 2, and Outcome 3 occur.

It would be difficult to interpret data on the frequency of occurrences of Outcome 3, since regulating is the standard business of a regulatory agency. The mission of the Service is to issue regulations to protect species listed for protection under the ESA. It could well be that thousands of times a day, a Service regulation will preclude some otherwise lawful activity, such as the shooting of bald eagles. There is nothing troubling or meaningful about such an outcome, as the Service is simply carrying out its mission. In such a situation, there would be no question as to its legitimacy.

Using Farber's terminology, Outcome 1 is negative slippage. It is also difficult, but not impossible, to obtain and interpret data on the fre-

[178] For examples of the instances of litigation, see *supra* text accompanying note 158.

quency of occurrence of negative slippage. Abundant evidence exists regarding the failure of a regulatory agency to enforce a regulation or to issue a regulation that the authorizing statute clearly mandates.[179] Analyzing negative slippage, while important and interesting, is outside the scope of this Article and must be examined elsewhere.

The empirical task for the model is to analyze cases of Outcome 2 in which *R* and *L* agree to an HCP compromise. This model characterizes HCPs by one parameter: the fraction of land allowed for development, *h*. Conceptually, *h* represents some fraction of the initial land that *L* intended to develop. Thus, 1–*h* represents the remainder of the property, and it is the fraction of the property that is set aside for preservation and cannot be used for development purposes.

While there are many different terms in an HCP, for the sake of simplicity, I normalize all of these terms into a particular unit: their cost to the landowner. The manner in which I accomplish this is described in detail in the Appendix.

1. Effect of a Potential Challenge by L

The effect of a potential challenge by *L* colors the decisions made at earlier stages of the game. Consider first the situation in which the probability of a successful challenge by *L* (denoted *s*) is quite low. A low probability of a successful challenge means that *L* is unlikely, even if she is dissatisfied with her state of affairs, to challenge *R*. Because this is a game of symmetric information in which there are no secrets, *R* has this knowledge and will only offer an HCP compromise (Outcome 2) that is quite favorable to itself.[180] Or, *R* may opt to regulate and not offer an HCP compromise at all, knowing that *L* is unlikely to retaliate with a challenge. Thus, at node *R1*, *R* will regulate, preserving the entire property with the comfort of knowing that it will not be challenged (Outcome 3). At node *L1*, *L* will acquiesce in the regulation and obtain zero profits, while *R* suffers zero damages.[181]

Consider now the situation in which the probability *s* of a successful challenge by *L* is quite high. A successful challenge provides *L* with all

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[179] For example, EPA missed deadlines for establishing effluent guidelines under Section 304 of the Clean Water Act, 33 U.S.C. § 1314(b) (1994), by as much as fifteen years, and even now effluent guidelines are inconsistent. Farber, *supra* note 58, at 301–02. EPA has avoided regulating toxic air pollutants under the Clean Air Act and been lenient towards states that fail to meet their obligations under the Act. *Id.* at 302–03.

[180] *L* could make a counteroffer in this game, but the subsequent bargaining process would still be one in which *L* was at a disadvantage.

[181] An example of this situation in which *L* has a low probability of successful challenge might be a regulation that is widely accepted as being within the authority of the Service, so that there is no question regarding its legitimacy, such as a prohibition on the direct and intentional killing of a listed species. This is so widely accepted as within the legitimate authority of the Service that there is no danger of any challenge. Within these parameters, the Service can issue a regulation without having to compromise.

of her planned profits (denoted Π) minus her litigation costs, a highly favorable outcome (Outcome 5). A high probability of this occurrence means that the prospect of a challenge is more appealing to L and more likely to occur. How does that affect R's original decision? R knows that if it regulates L, then L will challenge, and R is likely to lose that challenge and suffer the full amount of social damages, in addition to the costs of meeting that challenge. R would be more inclined to try to reach an HCP compromise (Outcome 2), but R would have to make the HCP compromise very favorable to L because of the high probability of a successful challenge. R might be so discouraged by the prospect of losing a challenge that R might fail to regulate when it is not possible to reach an HCP compromise.[182]

An HCP compromise may offer possible benefits in addition to saving the costs of a challenge. The process may give rise to a variety of collaborative benefits, which might justify R's agreement to an HCP compromise even when a challenge by L is unlikely to succeed or justify L's agreement to an HCP compromise even when she has a high likelihood of success in a challenge.

A special case of the latter pertains to the legal destruction of habitat or killing of species prior to a listing that would make such behavior illegal.[183] As discussed above, prior to the listing of a species, a landowner may legally destroy species and habitat without legal consequence and may even destroy habitat of a listed species if there are no species present. However, by agreeing to an HCP, L obtains other benefits. In the North Carolina timber example, it would have been costly and wasteful for the landowner to destroy habitat solely to avoid prospective ESA restrictions but not as costly as complying with ESA restrictions themselves. Avoiding wasteful and costly preemption actions is an example of a benefit of an HCP for landowners (W_L in the game).

2. *Shoot, Shovel, and Shut Up*

There is yet another modification that should be made to the model to illustrate another important aspect of regulatory bargaining. As noted above, because of chronic under-funding, the Service has a severe enforcement problem: it is unable to detect illegal behavior on private lands, as exemplified by its SSSU problem. Lack of resources and access

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[182] An example where L has a high probability of successful challenge may occur when a land use restriction deprives a landowner of all economically beneficial use of her land, such that a regulatory takings lawsuit would have a high chance of success. In such a case, R may shy away from regulating and may not even have the bargaining power to reach an HCP compromise. Clearly, however, if they bargain, L's ability to succeed in a regulatory takings lawsuit will strengthen her position relative to R.

[183] *See supra* notes 151–156 and accompanying text.

to private property has deprived the Service of the ability even to know of the presence of endangered or threatened species on private property.

Modeling the SSSU problem would mean providing *L* with another option at node *L1*. In addition to acquiescing in the regulation and challenging the regulation, *L* can also simply ignore the regulation and attempt to carry out her development as planned without being caught.[184] With probability *z*, she will avoid detection. With probability 1–*z*, she will be caught and will pay a fine of *F* to the Service.[185] If *L* gets away with her SSSU strategy, she will enjoy all of the profits of her planned development, and the Service will suffer the full external social damages of the development. If, on the other hand, *L* is caught, she will not enjoy any profits and will pay a fine to *R*, which will avoid any external social damages and will also gain a payment of *F*.[186] This modification is added to the game in Figure 3.

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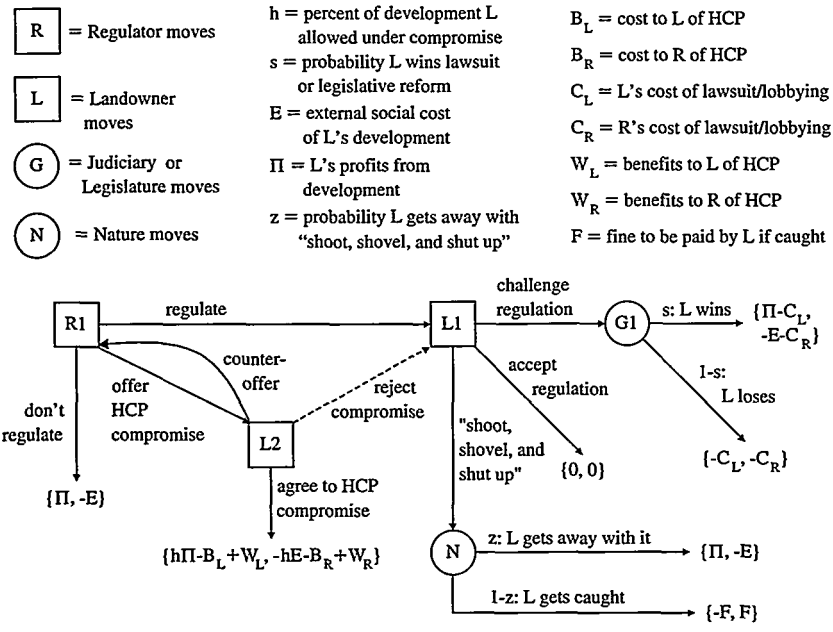
[184] This is to be distinguished from a self-permitting landowner who will undertake some mitigation strategies aimed at aiding listed species so as to avoid scrutiny from the Service.

[185] SSSU would involve a relaxation of Assumption 7 that *R* and *L* have access to the same information in the game.

[186] When chance plays a role in determining the outcome in game-theoretic parlance, it is referred to as "Nature" making a move. Hence, Nature, moving at the circular node *N*, will determine if *L* will be successful in avoiding detection. Note that this is exactly the same role that an outside legislative or judicial entity plays in determining whether *L* is successful in her challenge to the regulation. This representation posits that whether *L* wins her lawsuit or legislative challenge is a matter of simple chance, the probability of which she cannot affect, apart from trying her best to win. Also, *L* cannot affect the probability that *L* will get caught shooting, shoveling, and shutting up, apart from her obvious effort to avoid detection.

Figure 3. HCP Bargaining Model With "Shoot Shovel and Shut Up"



The addition of this option does not add as much complexity to the game as it would appear. By adding the option of an SSSU strategy at node *L1*, *L* can now choose from among the best of three options instead of the better of two. In fact, if the probability of impunity for *z* is high enough, the availability of an SSSU option at node *L1* is tantamount to increasing the probability of a successful lawsuit because a lawsuit to challenge *R* becomes unnecessary. However, the effect upon *R* is the same: *R* will still suffer the full external social damages of development if *L*'s strategy is successful.[187] *R* must bargain with the landowner at node *R1* as if *R* was facing a potential challenge.

By adding the SSSU option to the game, the profound influence of the Service's enforcement problem becomes clear. A severe SSSU problem functions as if the Service were operating under the threat of a high probability of a successful challenge. Even if the legitimacy of the Service's authority is not questioned, its ability to execute the goals of protecting listed species is highly compromised if it cannot enforce the ESA and its regulations.

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[187] The outcomes are not strictly the same because of the fines that *R* will be able to collect from *L* if caught. See the Appendix for a more detailed explanation.

If the Service negotiates HCPs in the shadow of its enforcement problem, then it may be inclined to make HCPs more generous than it otherwise might. Under such circumstances, the Service may use HCPs to engage landowners in some kind of non-adversarial relationship. The Service's reasoning may be that a highly generous HCP is better than nothing because it cannot detect violations. The Service may also embrace HCPs because they reduce the need for enforcement as, in Freeman and Langbein's parlance, HCPs enjoy more legitimacy in the eyes of the landowners than ESA regulations, and would thus enjoy high compliance.[188]

If the Service's enforcement problem is severe enough, it may not only undermine the HCP process, but also completely undermine the ESA. Note that if z is high enough, L may not have any incentive to react to the Service's actions, unless the Service offered more benefits in an HCP than L could obtain from defying the Service in a SSSU strategy.

3. Self-Permitting

The self-permitting option enables landowners to avoid Service scrutiny by developing their land with voluntary mitigation measures to aid listed species and introducing some interesting complexities into this game.[189] The possibility of self-permitting is due to implicit Service determinations that certain land uses and land use practices are not likely to be prosecutable as a Section 9 take. In effect, there are certain land uses and land use practices for which the probability of a successful challenge by the landowner is so high that the Service will decline to regulate, and the possibility of an HCP compromise is not alluring enough for the landowner to accept. But land uses and land use practices that are self-permitted do not contemplate full development of property leading to full profits Π and full external social damages E. Self-permitting changes the project to avoid regulation and creates a situation in which it would be foolish for the Service to attempt to regulate the land use or land use practice. The landowner changes the project so that some profits Π are sacrificed (and external social damages E decreased) in exchange for an increase in the probability of a successful challenge, s, in order to ensure that Outcome 1 occurs. Attempting to model the potentially rich relationships between s, Π, and E is beyond the scope of this Article, and data on the projects that are self-permitted are impossible to collect.

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[188] Freeman & Langbein, *supra* note 22, at 69–70.

[189] *See* Ruhl, *supra* note 161; *see also* Section V.C.3.

E. Theoretical Model Results

This game-theoretic model does not predict the exact circumstances under which HCPs occur or judicial or legislative challenges occur, but it helps explain some phenomena that are observed in the context of controversial environmental regulations. To recapitulate, this model illustrates several important points:

Result 1: The threat of a challenge to regulation affects the behavior of the regulator.

A regulator that faces a challenge may be inclined to seek a compromise, engage the regulated party in some sort of a non-adversarial relationship, or obtain possible side benefits from such a relationship. Such a regulator may also simply decide not to regulate: in the face of a challenge that is likely to succeed, the regulator may not spend the resources to defend the regulation and possibly risk an even greater loss.

Result 2: Regulatory compromises can avoid challenges: the regulator may prefer regulatory compromises to a traditional top-down regulation, and the regulated party may prefer regulatory compromises to a successful challenge.

Because of the face-to-face nature of negotiations, regulatory compromises provide some benefits that may be difficult to quantify but that may be identified, such as information-sharing. The legitimacy benefit may be important to a regulator, and a compromise may mean more than simply avoiding litigation costs. An HCP compromise could create some version of the legitimacy benefit discussed by Freeman and Langbein, in which regulated parties are more likely to comply with a negotiated agreement than a regulation that was issued without their input.[190]

Result 3: Enforcement problems can make regulators more generous in negotiating regulatory compromises.

Just as legislative and judicial uncertainty associated with a controversial regulation may make regulators more eager to compromise with regulated parties, an enforcement problem may make regulatory compromises seem more palatable. In the context of the ESA, the SSSU problem almost certainly makes the Service more eager to compromise with landowners through HCPs.

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[190] Freeman & Langbein, *supra* note 22, at 69–70.

Result 4: Enforcement problems, if severe enough, can undermine the ESA altogether.

If the probability of landowner noncompliance without detection is great enough, then landowners have no reason to respond to the Service's actions without an enforcement initiative. If the SSSU strategy occurs frequently enough, landowners can ignore ESA prohibitions in their development decisions.

Result 5: The availability of a regulatory compromise option can ameliorate destructive preemptive behavior of regulated parties.

The costlier a prospective regulation, the greater the incentive for regulated parties to attempt to avoid the costs. In the context of the ESA, HCPs can relieve some pressure for preemptive habitat destruction.

F. An Empirical Framework for Analyzing HCPs

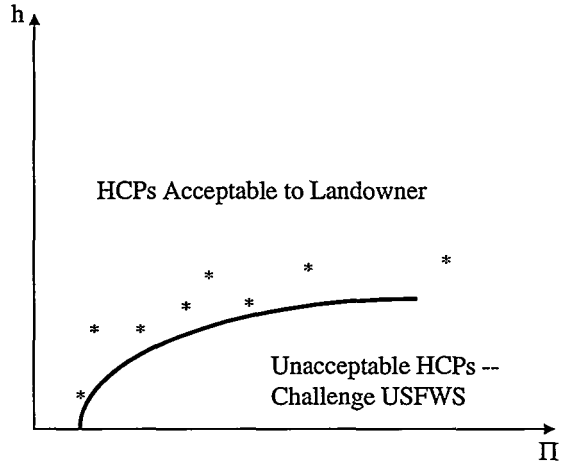
Although the game is an abstract one, a number of empirical results can be derived. Because the HCP compromise is the outcome of the game that is most conducive to study, empirical research must center upon the HCPs themselves. The most important empirical question is whether the Service (as R in the game) or the landowners (as L in the game) have been consistently out-negotiating the other side in developing HCPs. In assessing the value of HCPs (and reinvention and negotiated rulemakings generally), it is important to know whether there is any fundamental imbalance occurring in a bilateral negotiating paradigm of regulation.

1. Is the Service Winning?

The game provides a mapping of possible HCPs such that we can make a determination as to whether one side is consistently winning the negotiations over the terms of the HCPs. Consider first the game from the viewpoint of the landowner. If the Service possessed all of the bargaining power, then it would offer only HCPs such that the landowners would find the HCPs just barely attractive enough to forego the alternative of challenging the Service. If the Service held all of the bargaining power, then we would observe consistently that HCPs would contain terms that are very close to the breaking point for landowners. In the terms of this model, the fraction of land allowed for development, h, in all of the HCPs is such that if h were any lower the individual landowners would challenge the Service. Since we observe that litigation and lobbying challenges have rarely come to a head, we can conclude that the Service has successfully avoided challenges. However, in analyzing HCPs, the

question is how close the Service or the landowners come to walking away from the bargaining table. A mapping of HCPs that are acceptable to landowners is shown in Figure 4, with hypothetical data points representing a situation in which the Service is consistently pushing landowners to the brink of challenging.

Figure 4. Expected Scatter Plot of HCPs When USFWS is Consistently Winning Negotiations



The zone "HCPs Acceptable to Landowner" is the region in which the fraction of land allowed for development in the HCP, *h*, is high enough so that the landowner will not resort to challenging the Service. The zone "Unacceptable HCPs—Challenge USFWS" is the region in which *h* is too low, and the landowner would rather challenge the Service in court or Congress. The upward-sloping but downward-curving dividing line between the two regions is derived formally in the Appendix, but the intuition behind its shape is that the more valuable the land is as developed property, the more important it will be to the landowner to obtain a higher fraction of land allowed for development (i.e., as Π gets higher). At the margin, every square inch of land becomes more valuable, and the landowner can be expected to fight harder to persuade the Service to allow it to be developed.[191] Thus, the

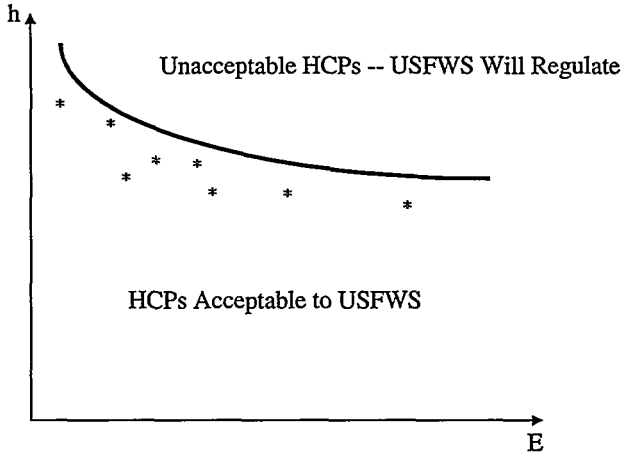
[191] This is what economic theory would generally predict. However, it is true for extremely small projects that it may not be possible to curtail development too much. For a single-family home that is not as profitable as a large subdivision, the landowner may fight harder to obtain permission to develop. Thus, the empirical analysis below excludes HCPs that involve single-family homes.

dividing line between acceptable and unacceptable HCPs slopes upward because the more profitable the planned development, the higher the breaking point for the landowner. The hypothetical HCPs represented by the data points denoted by a "*" in Figure 4 all hug the curved dividing line. Graphically, this scatter plot represents a situation in which the Service is consistently winning the negotiations for all of the HCPs represented by the individual data points. Note that since it would be difficult to determine the exact location of the dividing line, we must rely upon matching data to the unique upward-sloping, downward-curving shape. Observing a particular pattern of data points, not the location, provides the only clue as to whether the Service is winning the negotiations.

2. Is the Landowner Winning?

Now consider the game from the viewpoint of the Service. The Service desires to limit development as much as possible (minimize h as much as possible), and at a certain point, if the landowner insists upon too much development, the Service may be inclined to take its chances with facing a challenge by L. This is the zone "Unacceptable HCPs—USFWS Will Regulate" in Figure 5. The zone "HCPs Acceptable to USFWS" is the region in which the fraction of land to be developed, h, is not too high. The dividing line between the two zones is downward-sloping and upward-curving because the more valuable the land is as habitat, the more damaging it would be to allow development and the Service will bargain harder to minimize development. Like the landowners, the Service will have a lower breaking point for land that is valuable as habitat (high E) and will demand a smaller fraction of development as a condition of a compromise.

Figure 5. Expected Scatter Plot of HCPs When Landowner is Consistently Winning Negotiations



In Figure 5, the scatter plot of hypothetical HCPs represented by the data points all hug the downward-sloping, upward-curving dividing line for the Service. Such data would indicate that the Service is consistently being driven to its breaking point by landowners and losing the negotiations. This is not to say that the Service is not doing its job; it is possible that the surplus that is created by a bargain is almost completely appropriated by the landowners, but as long as the HCPs do not "appreciably reduce the likelihood of survival of species in the wild," the HCPs are still legal. However, if the Service were losing the negotiations, then disturbing questions arise about the relative bargaining powers of the Service and the landowners and about possible instances of regulatory capture.[192]

3. Is Neither the Landowner nor the Service Winning?

It is a different matter to establish the null hypothesis, which is that neither the Service nor the landowners were consistently winning the negotiations and that the negotiations are reasonably balanced. The null hypothesis merely represents a set of prior beliefs and not an established

[192] Regulatory capture is generally understood to refer to the undue influence of a regulated party over the regulator. IAN AYRES & JOHN BRAITHWAITE, RESPONSIVE REGULATION: TRANSCENDING THE DEREGULATION DEBATE 54–100 (1992). *See also* George J. Stigler, *The Theory of Economic Regulation*, 2 BELL J. ECON. & MGMT. 3 (1971). A central thesis of Stigler's article is that "as a rule, regulation is acquired by the industry and is designed and operated primarily for its benefit." *Id.* at 3.

set of facts. Thus, data that fail to establish either hypothesis (that the Service is winning or that the landowners are winning) does not necessarily establish the null hypothesis that neither is winning.

Nevertheless, one might expect that if the situation were such that in some cases the Service had gotten the better part of a deal and in other cases the landowner had gotten the better part of the deal, the data points would neither hug a downward-sloping, upward-curving line (indicating that the landowners are winning) nor an upward-sloping, downward-curving line (indicating that the Service is winning). One might expect scatter plots that resemble those in Figures 6 and 7. Again, it is worth emphasizing that these plots would merely suggest, but would not establish, the possibility that neither side is consistently pushing the other to its respective breaking point.

Figure 6. Expected Scatter Plot of HCPs When Neither the USFWS or Landowners are Consistently Winning.

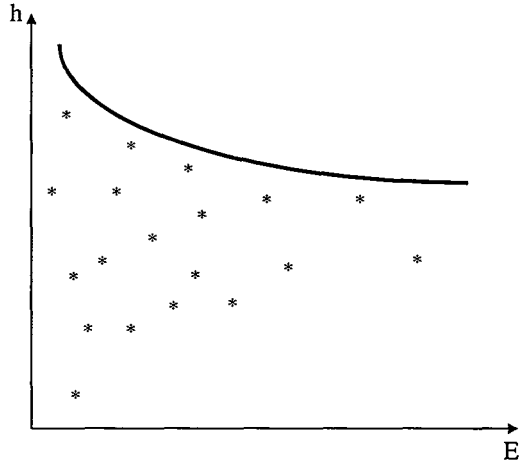
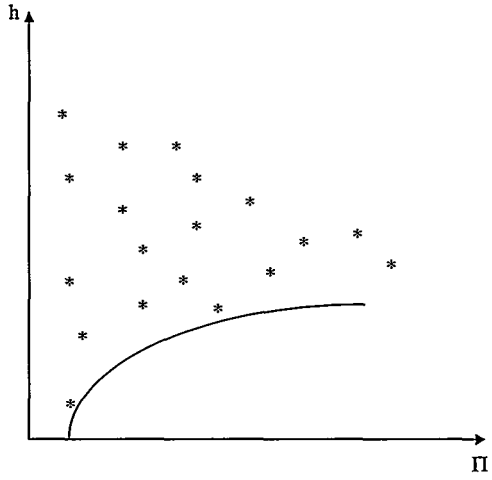


Figure 7. Expected Scatter Plot of HCPs When Neither the USFWS or Landowners are Consistently Winning.



Thus, in order to conclude that the Service is winning, one must observe a robust data pattern resembling that in Figure 4. In order to conclude that the landowners are winning, one must observe a robust data pattern resembling that in Figure 5. One could not make the affirmative conclusion that the regulatory negotiation process is reasonably balanced, that the Service is winning some, and that the landowners are winning some unless one were able to gather substantially more data than that which is foreseeably available.[193]

G. An Empirical Case Study: The Golden-Cheeked Warbler

1. Background

The GCW, which was listed as endangered in 1990, is a small, highly territorial songbird that nests exclusively in the Edwards Plateau area of Central Texas.[194] While in Texas, it nests only in juniper trees,

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[193] Hypothesis testing only operates to disprove null hypotheses. Over time, if null hypotheses are tested again and again and fail to be disproved, then they gain some acceptance as fact. However, the current data on HCPs is so limited that it would be difficult to imagine the possibility of marshalling enough data to establish the null hypothesis—that neither the Service nor the landowners are winning. Thus, for all practical purposes, the techniques described in this Article cannot prove the null hypothesis.

[194] LESLIE JETTE ET AL., U.S. ARMY CONSTRUCTION ENGINEERING RESEARCH

using the shedding bark to construct its nest.[195] The GCW uses only Ashe juniper patches that are older than forty to fifty years old, making the GCW a highly specialized species.[196]

By far the greatest threat to the survival of the GCW is habitat destruction. In 1976, the population of GCWs was estimated to be between 15,000 and 17,000.[197] Reliable updates of the estimated population do not exist, but an estimate in 1990 was that enough habitat existed to support a maximum of only 4800 to 16,000 pairs.[198] This decline in GCW population occurred as the human population of the capital city of Austin grew by sixty-four percent from 1980 to 1997.[199] The rapid growth of the Austin area has placed existing GCW habitat under immense development pressure. Property tax assessments grew by 188% in Austin from 1983 to 1998.[200] Thus, increases in property values accentuate the pressures to develop and increase the opportunity costs of preserving GCW habitat.

Seventy-nine HCPs that address the GCW are currently in effect.[201] The vast majority of these HCPs are for the construction of single-family homes on single lots of five acres or less. Negotiated with individual landowners, these HCPs are virtually identical in that they require no significant mitigation measures other than the payment of a fee, which is typically $1,500 and which is used by the Service to acquire GCW habitat off-site. These HCPs also contain standard clauses designed to minimize the impact of residential construction on the GCW, such as the prohibition of construction within 300 feet of a GCW nest during the breeding season, which is March 1 through August 1; a requirement that any revegetation be done with native plants; and a requirement that the landowner minimize use of herbicides and pesticides. These HCPs are intended to make the process relatively easy for individual landowners.

LABORATORIES ("USACERL"), U.S. ARMY CORPS OF ENGINEERS, USACERL TECHNICAL REPORT 98/52, DEMOGRAPHICS OF THE GOLDEN-CHEEKED WARBLER *DENDROICA CHRYSOPARIA* ON FORT HOOD, TEXAS (1998), *available at* http://owww.cecer.army.mil/TechReports/hay_warb/hay_warb.post.pdf.

[195] *Id.*

[196] *Id.*

[197] WARREN M. PULICH, THE GOLDEN-CHEEKED WARBLER: A BIOECOLOGICAL STUDY 11 (1976).

[198] Endangered and Threatened Wildlife and Plants; Final Rule to List the Golden-cheeked Warbler as Endangered, 55 Fed. Reg. 53,153, 53,154 (Dec. 27, 1990) (codified at 50 C.F.R. pt.17 (2000)).

[199] It is even more revealing that the population of the larger Metropolitan Statistical Area grew by eighty-two percent over the same time period, indicating that the growth has been accommodated by a sprawling land use development pattern. *See* Shi-Ling Hsu, A Model of Environmental Compromise Between Regulators and Landowners Under the Endangered Species Act 97–98 (1998) (unpublished Ph.D. dissertation, University of California at Davis) (on file with the Harvard Environmental Law Review).

[200] *Id.* at 97.

[201] The Service maintains a web site with an inventory of all current HCPs. U.S. Fish & Wildlife Serv., *HCP Database*, *at* http://endangered.fws.gov/hcp/index.html (last modified Aug. 29, 2001) (on file with the Harvard Environmental Law Review).

Clearly, the Service does not wish to create a whole class of sympathetic plaintiffs out of these individual landowners.

Of the GCW HCPs, I utilized a subset of twenty-one HCPs, developed and agreed upon between 1993 and 1998, that generally involved corporate landowners and developers. While these HCPs contain very similar clauses, they are nevertheless more complicated because various other mitigation measures are required of the landowner. Some are required to pay money to the Service for the purpose of acquiring off-site habitat; some are required to actually acquire off-site habitat; others are required to set aside a portion of the property to be developed as GCW habitat. Most involved at least two of these forms of mitigation measures. I utilized these twenty-one HCPs as units of observation for testing the hypotheses developed and discussed in Section V.F. While there is clearly a well-established set of base mitigation measures, these HCPs are suitable for this purpose because the most significant and costly measures are a matter of negotiation between the Service and the landowner. It is also the most comprehensive data set available. No other species, not even the embattled northern spotted owl, has been the subject of more HCPs than the GCW, even omitting the many small-lot HCPs for single-family homes of individual landowners.

I used this data set of GCW HCPs to test the dual hypotheses about HCP compromises: (1) the Service is being consistently pushed to its breaking point for compromise when the Service might be inclined to risk a challenge, and (2) the landowner is consistently pushed to her breaking point when the landowner may be inclined to challenge the Service. The null hypothesis is that neither party is being consistently pushed to its breaking point.

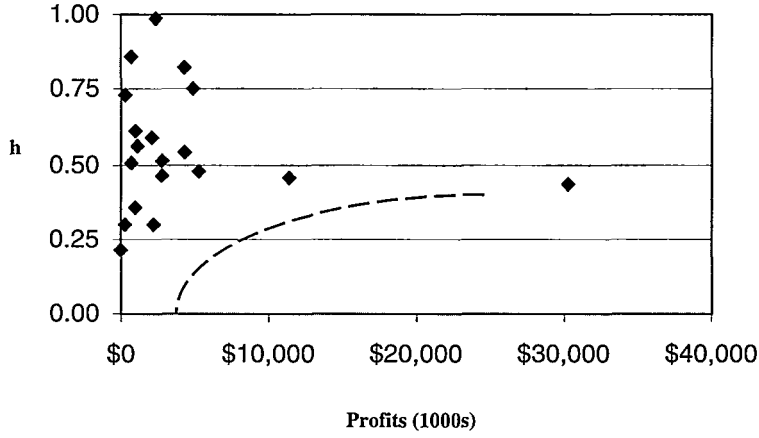
To operationalize the variable h, I estimated the fraction of the profits from developing the entire property that would be realized under the HCP. Thus, h represents the actual profits from an HCP divided by the potential profits that would be earned if the landowner could develop the entire property. Under this analysis, h becomes a money fraction, rather than a land fraction. This is of no empirical significance: h expressed as a money fraction can be translated into the fraction of land allowed for development by dividing both the numerator and denominator by the per-acre value of the land.[202] Roughly speaking, I estimated actual profits by multiplying the number of acres allowed to be developed under the HCP by the property value, measured on a per-acre basis, and subtracting the total mitigation costs required of the landowner under the HCP. I estimated potential profits as the total number of acres covered by the HCP multiplied by the per-acre property value. The variable h is the actual profits divided by the potential profits. Thus, in this formula,

[202] These data and the estimation of profits are described in more detail in the Appendix.

profits do not include the cost of acquiring or developing the property because these data were not available.

To test the hypothesis that the Service is pushing the landowners to the brink of challenging the Service's regulatory authority, it is necessary to operationalize the variable Π that measures the profits of the planned development. I used potential profits, which were also the denominator of h, as the measure of profits. The set of GCW utilized as data HCPs is plotted in Figure 8.

Figure 8. Plot of h vs. Profits as Π for Golden-Cheeked Warbler HCPs



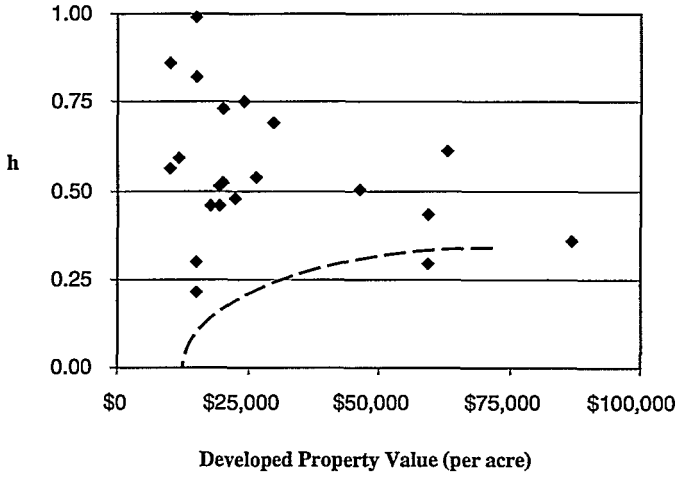
To illustrate the variation in profits among HCPs, this plot excludes two HCPs: (1) the HCP in which profits were $90 million and $h = 0.52$, and (2) the HCP in which profits were $53 million and $h = 0.69$. The plot would not differ substantially if the two large HCPs were included, but including them would make it difficult to view the smaller HCPs as separate data points.

I also used a per-acre value of developed property in the area of the planned development as an alternative measure of Π to test this hypothesis.[203] This is a different measure of profits of a planned development be-

[203] To find this information, I consulted the Travis County Central Appraisal District property directory, which is posted on the District's Web site. *See* Travis Central Appraisal District, *Appraisal Roll*, *at* http://www.traviscad.org/travppname.htm (last visited Dec. 1, 2001) (on file with the Harvard Environmental Law Review). The directory contains information on every assessed property in the county. Using this directory, I obtained a particularized property value per acre for each HCP. In some cases, the specific property covered by the HCP was listed in the directory. In other cases, I estimated property values by examining comparable properties in the vicinity of the HCP.

cause it measures the quality of property for development purposes. I did not exclude the two large HCPs for this plot. The resulting scatter plot is shown in Figure 9.

Figure 9. Plot of h vs. Property Value as Π for Golden-Cheeked Warbler HCPs

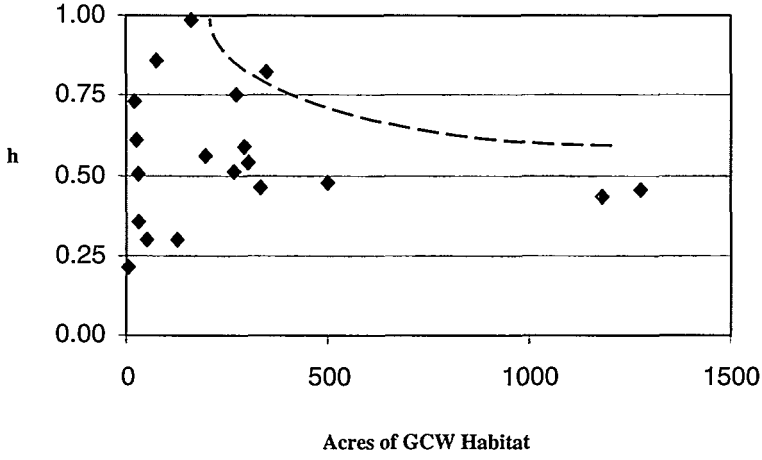


For both of these plots, the data do not suggest that the Service is consistently driving the landowner to the brink of challenging its regulatory authority. If this were the case, the diamond-shaped data points would take the shape of the upward-sloping, downward-curving line that separates the region of acceptable HCPs and unacceptable HCPs, suggesting that it is hugging a dividing line. Of course, it is impossible to know the exact location of the dividing line, but the data points shown above do not reveal a pattern. These plots are merely suggestive, and they are not conclusive evidence.

To test the hypothesis that landowners are consistently driving the Service to the brink of regulating, daring the landowners to challenge its authority, it is necessary to operationalize a variable that measures the external social damages of development. I use the number of acres of GCW habitat contained on the property as such a measure. The greater the number of acres of habitat at stake, the greater will be the extent of damages from development. The same measure of *h* used in the previous plot is used. The resulting plot of GCW HCPs is shown in Figure 10. Again, the two largest HCPs are omitted so that the smaller HCPs can be

distinguished, but their omission does not change the nature of the scatter plot.

Figure 10. Plot of *h* vs. Acres of Habitat as *E* for Golden-Cheeked Warbler HCPs



As with Figures 8 and 9, Figure 10 fails to reveal any pattern that would be consistent with the offered hypothesis. There is thus no evidence that would suggest that the landowners are consistently driving the Service to confrontation. This remains true despite the suspicion that the landowners would be more adept at the bargaining process, especially since the lawyers and consultants working on behalf of the landowners are likely to be familiar with the Service's bargaining position, while the Service is not apt to know about the individualized situation of each landowner approaching the bargaining table.[204]

On June 29, 1995, the Supreme Court handed down a decision that could have dramatically changed the calculus of the entire HCP program. The Court held in *Sweet Home* that the Section 9 prohibition could reach habitat modification activities on private property that adversely affect listed species.[205] Rather than cement the Service's regulatory authority over private property, however, the decision actually narrowed the scope of activity that the Service could prohibit under Section 9. Because of increasingly narrow interpretations of a Section 9 take adopted by the Service for purposes of winning the case, the Court effectively handed

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[204] *See supra* note 169 (discussing how lawyers who represent landowners are familiar with the terms of all previous HCPs).

[205] Babbitt v. Sweet Home Chapter of Cmtys. for a Great Or., 515 U.S. 687 (1995).

the Service a new set of limitations rather than a license to freely impose restrictions on private property.[206] This decision could have had an effect on the bargaining positions of the Service and landowners seeking HCPs. To see if the *Sweet Home* decision had any effect on HCP negotiations, I separated out the nine HCPs that were signed before from the twelve HCPs that were signed after the *Sweet Home* decision. There was no change in the nature of the plots, indicating that *Sweet Home* did not have a substantial effect on HCP bargaining in this case.

The data shown in Figures 8, 9, and 10 all seem to have at least the suggestion of a funnel shape, and resemble the scatter plots in Figures 6 and 7, which we might expect to see if neither the Service nor the landowners were consistently winning the negotiations. This is merely suggestive of the null hypothesis that neither the Service nor the landowners are consistently winning the negotiations and that the negotiation process seems reasonably balanced. However, this does not constitute evidence of this null hypothesis.

2. Additional Econometric Analysis

In addition to making a visual inspection of scatter plots, a more systematic econometric analysis may be used to test the dual hypotheses that either the regulator or the regulated party is consistently winning the negotiation. Rather than eyeballing a scatter plot and attempting to discern a pattern resembling one of the curved dividing lines, one can formally test the hypotheses using standard econometric methods. Econometric analyses using the data and variables presented in Figures 8 to 10 above indicated that no significant statistical relationship existed to verify either of the hypotheses. Thus, the statistical analysis confirmed what our visual inspection of the scatter plots suggested. Again, it is important to note that this is not conclusive evidence. This data set consists of only twenty-one HCPs. Often, conclusive econometric results cannot be obtained from such a small data set, even if the underlying relationship exists. In other words, the Service or the landowners in Austin may actually be winning the HCP negotiating process, but the data may not reflect it.

To measure the profits from a planned development and the external social damages from a planned development, I used variables other than those used in Figures 8, 9, and 10. These new variables produced models with stronger statistical relationships with h.

For measures of profits, I used the average lot size of the planned development and the distance from downtown Austin. I calculated the lot size by dividing the total area of the property to be developed by the number of units planned for construction. The rationale for this formula-

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[206] Steven P. Quarles et al., Sweet Home *and the Narrowing of Wildlife "Take" Under Section 9 of the Endangered Species Act*, 26 Envtl. L. Rep. (Envtl. L. Inst.) 10,003 (1996).

tion is that larger lot sizes are a signal of higher profitability of the project. If the land is more valuable when developed, then the landowner will bargain harder to keep it available for development, and h will be higher. I calculated the distance from downtown by consulting a map and measuring the distance from the state capitol building. The rationale for this formulation is that development projects closer to Austin's vibrant downtown are more valuable.

For measures of external social damages resulting from development, I used two other variables, the habitat density of the property and the bird density of the project. The habitat density was the fraction of land that was considered by the Service to be habitat. This information was contained in the HCPs. The bird density was the number of confirmed GCW territories divided by the size of the property. Both of these measures were intended to measure the quality of the property as habitat. The results are presented in Table 1. An explanation of the derivation of the models is contained in the Appendix.

Table 1. Nonlinear Estimations for Testing Dual Hypotheses
(t-ratios in parentheses)

Landowner winning $h_i = \beta_0 + \frac{1}{\beta_1 HABDENS_i + \beta_2 BIRDDENS_i}$		Regulator winning $h_i = \beta_3 - \frac{1}{\beta_4 LOTSIZ_i + \beta_5 DIST_i}$	
Log-likelihood	-10.998	Log-likelihood	-13.915
β_0	0.508 (13.530)	β_3	0.702 (15.411)
β_1	84.472 (2.226)	β_4	23.118 (2.112)
β_2	-200.16 (-2.116)	β_5	-0.181 (-1.004)

Both of these models contain some explanatory power, but neither model dominates the other and provides a conclusive explanation as to the magnitude of h. The estimations are mostly consistent with my prior expectations. As the habitat density becomes greater, h tends to be smaller.[207] As the lot size becomes greater, h tends to be larger. As the

[207] The variable *HABDENS* is in the denominator of the right-hand side of the equation. If *HABDENS* increases, it makes the term on the right smaller, and makes h smaller.

distance from downtown increases, *h* tends to be smaller, although the statistical relationship with this variable is statistically insignificant. The only anomalous result is that as the bird density increases, *h* tends to be larger. My examination of the HCPs suggests to me that the Service was much more concerned with the number of acres of habitat lost than the actual number of GCW territories lost from a planned development. Thus, HCPs involved some planned developments located in places that were fairly dense in GCW territories, but because the habitat was marginal or fragmented, the Service determined that the damage from losing such habitat was relatively small.

The log-likelihood statistics indicate that the model of the landowner winning the negotiation appears to provide a slightly better fit.[208] However, a formal statistical comparison of the two models indicates that neither model adequately explains the data.

3. Conclusions of the GCW Study

The empirical analysis in this Article is meant to demonstrate how it may be possible to employ the game-theoretic model to analyze the relative bargaining powers of a regulator and a group of regulated parties. Currently, there is no evidence to suggest that either the Service or the landowners in Austin are consistently pushing the other to the point of abandoning negotiations in favor of confrontation, but this does not rise to the level of affirmative evidence that negotiations are balanced. The empirical analysis does not either prove or disprove any hypotheses as to whether either the Service or the landowners have wielded any substantial bargaining power over the other. With only twenty-one data points, there are limits as to what statistical analysis could possibly accomplish.

The funnel shape of the data points does alert us to the suggestion that neither the Service nor the landowners are, in negotiating HCPs, consistently pushing the other to the brink of litigation. While this is not a conclusion, it raises the disturbing prospect that a greater level of arbitrariness exists for smaller projects than it does for larger ones. This is clearly an undesirable outcome from an administrative law standpoint, and it augments one of the arguments made in this Article that clearer statutory standards should be developed so as to better constrain the Service's discretion in negotiating HCPs. This is not only to ensure that

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[208] The log-likelihood statistic is a measure of how probable it is that the proposed model is exactly the correct model for the phenomena observed. The greater the statistic, the better and more explanatory is the model. For nonlinear models (such as the ones presented in Table 1), the process of trying to estimate the parameters of the model (the β coefficients in the model) is itself the process of trying to maximize the log-likelihood statistic. The process is known as maximum-likelihood estimation. For a general discussion, see GEORGE G. JUDGE ET AL., INTRODUCTION TO THE THEORY AND PRACTICE OF ECONOMETRICS 524–27 (2d ed. 1988).

the Service treats all applicants fairly and equally; it is to provide the Service with the legal cover necessary to bargain with landowners that are particularly aggressive in their negotiations.

The GCW study demonstrated a way of analyzing HCPs and other negotiated agreements generally. The proxy variables were imperfect, but there was no reason to believe that they were systematically biased in any way. The collection and the operationalization of the data used for this research was time-consuming but not unduly so. Future projects of this sort hopefully will be less difficult than this *sui generis* research project. While future researchers may employ different empirical methods, the methods presented in this Article should form a foundation for analyzing regulatory bargaining in other contexts.

VII. Conclusion

The most fundamental conclusion of this Article is one unlikely to generate controversy: that pressure in the form of legislative and judicial oversight of agencies has caused agencies to react by adopting negotiation-based strategies to preserve regulatory authority. The duress under which agencies have operated has varied greatly throughout the last two decades, and also among the different agencies.

At times during the past decade, it appeared as though the ESA, the Clean Water Act, and the Clean Air Act were in danger of repeal or substantial amendment or under a threat of judicial intervention. It was during those times that the regulatory agencies seemed most interested in negotiations with regulated parties. This Article has offered a model of the process by which legislative and judicial pressure altered agency behavior.

EPA seems to have generated the most controversy, but at the same time, pollution control remains a salient issue for most Americans. Threats to clean air and water seem much more visceral to Americans than threats to biodiversity. This has possibly served to keep the forces that would otherwise eviscerate EPA under control. Members of Congress are wary of being perceived as seeking to weaken pollution control laws, and the jurisprudence of regulatory takings has not yet wandered into the realm of pollution control. By contrast, threats to biodiversity seem to arouse a passion in Americans only when they involve charismatic megafauna, and Congressional representatives appear to be less afraid of being viewed as opposed to the ESA. Also, there were hints that regulatory takings jurisprudence could come into full conflict with the ESA. These differences have placed the ESA and the Service on more tenuous ground, and caused the Service to be more open than EPA in soliciting and accepting negotiable proposals under the reinvention rubric. The result has been hundreds of HCPs, but only several dozen Project XL agreements.

An administrative state with bilateral negotiations may indeed be inevitable. If that is the case, then mechanisms are needed for the constraint and monitoring of negotiations between agencies and regulated parties. Both the Project XL and the HCP contexts require clear statutory standards that constrain the ability of agencies to make concessions. Clearer standards would help ensure that negotiated agreements do not frustrate the basic goals of the underlying statutes and would empower agencies at the negotiating table. Furthermore, clearer standards would communicate to regulated parties what will be expected of them as they develop plans for their property.

Living with a more negotiation-oriented administrative state is also more tolerable if we can evaluate ex post the effectiveness of agencies in carrying out their statutory mandate through negotiations. This Article presents an empirical framework that demonstrates how this may be accomplished. While the data used for this empirical analysis do not permit robust conclusions to be drawn, the broader lesson from the empirical analysis is that if the generosity of negotiated agreements varies consistently with the environmental importance of the project, then we should be concerned with the agency's bargaining position. A negotiated agreement should result in both sides gaining something that accrues from the trading process, and there is no reason that the landowner should acquire all of the surplus. Finally, the transparency of negotiations must be protected to enable environmental organizations that play a watchdog role to participate by invoking their ability to sue.

Enforceability issues also affect the terms of negotiated agreements. In the case of the pollution control statutes, monitoring devices have made EPA's enforcement job considerably easier. In the case of the ESA, the Service lacks access to private property where oftentimes the Service is unaware of endangered and threatened species, which can thus be taken with very little risk of detection. This has also made the Service more generous in negotiating with landowners. To some extent, the negotiated agreement itself can ameliorate enforcement problems, but a severe enforcement problem can not only defeat the negotiation process but also undermine the goals of the ESA. HCPs may ameliorate the Service's SSSU problem, but landowners may feel no need even to negotiate with the Service in some cases. The SSSU problem is to some extent unavoidable, but is in substantial part a product of the chronic underfunding of the Service, particularly with respect to enforcement. The time has come for Congressional hostility towards the Service and the ESA at least to abate enough to recognize the need for law and order with respect to endangered and threatened species.

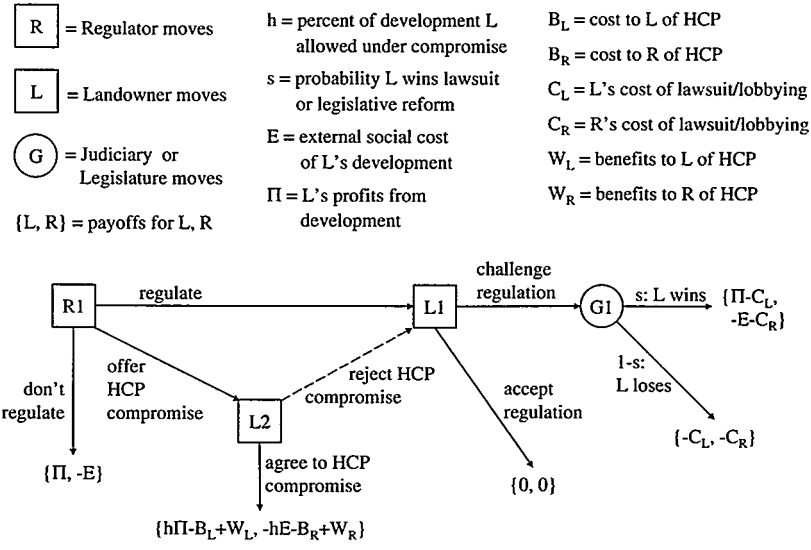
APPENDIX

Formal Solution to Game and Derivation of Dividing Line Curves for Regulator and Landowner

A formal solution to the game presented in Figures 1 through 3 is accomplished by a technique known as backward induction.[209] In a game where there is symmetric information (no secrets between the parties as to possible outcomes of the game, or as to the payoffs for each party), the outcome of a game can be determined by solving backwards from the end of the game and determining the best move for each player at each node. Threats must be credible in order to be effective. Threats to do something that are not beneficial are not credible.

Consider first the simple game 1, which is shown here again for convenience.

Figure 1. Simple HCP Model



At the end of the game where *L* challenges *R*'s regulation, there is a governmental entity, either legislative or judicial, that adjudicates *L*'s

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[209] For a general discussion of this technique of solving games, see generally MAS-COLELL ET AL., *supra* note 170, at 268–82.

challenge. With probability s, which is known to both parties, the governmental entity will rule in favor of L. When there is this type of probabilistic uncertainty, economic convention would express the payoffs entering into that uncertain situation by expressing them as a weighted average of the outcomes. That is, the payoffs to L of challenging the regulation equals the probability of winning times the payoff of winning (obtaining her full profits Π), plus the probability of losing times the payoff of losing (no profits at all), or

$$s \text{ x } \Pi + (1\text{-}s) \text{ x } 0 = s\Pi$$

Add to that L's costs of litigating or launching a lobbying battle, denoted C_L, and L's expected payoff of litigating or launching a lobbying battle is $s\Pi\text{-}C_L$.

Similarly, R's expected payoff, should she become embroiled in litigation or a lobbying challenge to its regulatory authority, is the probability of her losing times the payoff of losing (the external social damages), plus the probability of her winning times the payoff of winning (suffering no damages at all), minus the litigation or lobbying costs that she will incur no matter what the outcome, or

$$s \text{ x } -E + (1\text{-}s) \text{ x } 0 - C_R = -sE\text{-}C_R$$

Continuing to solve backwards, we look at L's payoffs at node L1 to determine what she will do. At node 1, her expected payoff of challenging R's regulation is, as we determined, $s\Pi\text{-}C_L$. Her payoff of accepting the regulation is zero. A landowner will thus pursue a challenge if her expected payoff of doing so exceeds the payoff of doing nothing, or if

$s\Pi\text{-}C_L > 0$ or

$$s > \frac{C_L}{\Pi}$$

This condition is illuminating. It tells us that if the probability of a successful challenge is high, or if there is much at stake for L (high Π), at least enough to outweigh the costs of the challenge, then L will proceed with a challenge. L is performing a cost-benefit test of whether or not to proceed with a challenge.

Continuing to work backward, we now consider R's decision at node R1. R enjoys the benefit of knowing what L will do, because we have assumed symmetric information available to both parties. If L will quietly accept regulation, R will know that and will compare the payoffs of not

regulating (-*E*, the external social damages), to the payoffs of regulating (zero, since *R* knows *L* will not challenge). Clearly, there is no reason for *R* to not regulate, since there is no need for her to suffer the external social damages when she knows that if she regulates, *L* will quietly accept the regulation, and cause no damages at all. *R* may offer an HCP compromise, but that is discussed below.

On the other hand, if *L* at node L1 will challenge the regulation, then *R* faces a different decision environment at node R1. Now, the expected payoff of regulating, since *L* will challenge the regulation, is $-sE-C_R$. This needs to be compared with the payoff of not regulating (again, -*E*) and the payoff of an HCP compromise. If the probability of *L* winning her challenge is high enough, then it may not be worth it for *R* to even bother regulating. That will be the case if the payoffs of not regulating are greater than the expected payoff of facing up to a challenge by *L*, represented as

$-sE-C_R > -E$ or

$$s > 1 - \frac{C_R}{E}$$

This condition illustrates that if the probability of a successful challenge by *L* is high enough, *R* might be better off giving up at the outset rather than risk incurring the costs of facing a challenge. *L* has to be willing to challenge at L1 in order for R to face this dilemma.

Tentatively, the *R*esults derived above can be summarized as follows into three cases:

(1) $s\Pi-C_L < 0$**.** If faced with regulation, *L* will not challenge at L1, because her payoff of simply accepting the regulation is greater than her expected payoff of challenging. *R* knows this, and will regulate at R1 without fear of challenge.

(2) $s\Pi-C_L \geq 0$ **and** $s > 1-C_R/E$**.** The chances of a successful challenge are so high that *R* is better off letting *L* develop rather than taking its chances with a challenge. *R* knows that *L* would challenge at L1, and *L* knows that *R* would rather suffer the full external damages rather than face a challenge. *R* will choose to not regulate at R1 in this case, and *L* will fully pursue her development plans.

(3) $s\Pi-C_L \geq 0$ **and** $s \leq 1-C_R/E$. *L* is willing to challenge at L1 and *R* is willing to face the challenge, so *R* will regulate at R1, knowing that it is headed for battle in the courts or Congress.

However, in the main text of the article I noted that empirically, challenges to regulation by landowners to the authority of the Service are rare. The reason for the lack of litigation has been the willingness of the Service to use HCPs to head off litigation. Thus, the Service has been able to change the third case from a showdown in the courts or in Con-

gress, to an HCP compromise. This brings us back to the statement in the main text that in the absence of actual challenges, there are only three outcomes: (1) R does not regulate and L completely develops the property, (2) R regulates the property (preserving the entire property as habitat) and L does not resist, and (3) R offers an HCP compromise, and after negotiation, R and L agree to an HCP. In addition, HCPs may provide collaborative benefits so that even if R is unafraid of a challenge, R may still propose an HCP to obtain some of the collaborative benefits, such as information-sharing and access to private property for monitoring purposes, benefits that would not be available if R simply regulated the property.

Since the main empirical interest lies in the HCPs themselves, the question becomes one of how attractive an HCP must be to induce L to agree to it. Depending upon how high s is, it may be difficult for R to find an HCP to L's liking. In order for R to be able to induce L to accept an HCP, it must be able and willing to offer an HCP such that L's payoff of agreeing to an HCP is greater than the expected payoff of challenging, represented as

$$h\Pi - B_L + W_L > s\Pi - C_L$$

In order for an HCP to be attractive enough to L to induce her to forego a challenge, the above condition must be satisfied. Isolating h, the above condition can be rewritten as

$$h > s - \frac{C_L - B_L + W_L}{\Pi}$$

We can assume that $C_L - B_L + W_L > 0$, because the costs of challenging a regulation (C_L) are probably greater than the costs of developing a compromise (B_L), and if you add in the benefits of the compromise (W_L), the sum of the three factors is almost certainly greater than zero. This condition provides an explanation as to the shape of the upward-sloping, downward-curving dividing line for L between acceptable HCPs and unacceptable HCPs. An acceptable HCP is one in which the above condition is satisfied, and an unacceptable one is one in which it is not. The above condition thus defines the dividing line.

How does a change in Π change the h required to satisfy the condition? Notice that as Π gets larger, the rightmost term on the right-hand side becomes smaller, but the right-hand side becomes larger. Thus, as Π gets larger, the h required to satisfy the condition gets larger. This makes sense; as Π gets larger, L will care more about keeping land available for development, since it is more valuable, and it will take a more generous HCP (larger h) to satisfy her, and induce her not to challenge. There is a

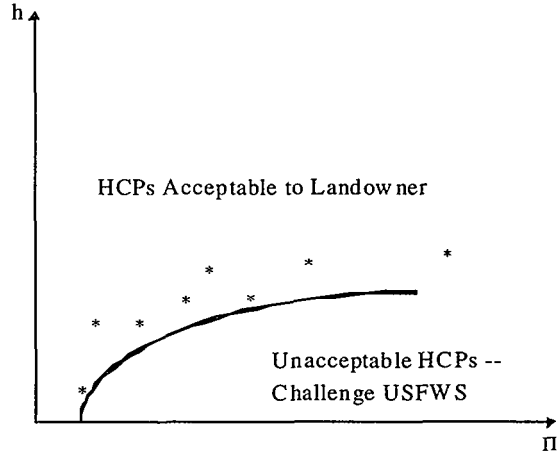
limit as to the effect Π has on the necessary h. As Π becomes infinitely large, the rightmost term approaches zero, and the above condition breaks down into h being larger than s. The larger Π is, the less is its marginal effect on h. Expressed in calculus terms, the above condition yields the derivative relationships

$$\frac{\partial h}{\Pi} = \frac{C_L - B_L + W_L}{\Pi^2} > 0 \quad \text{and}$$

$$\frac{\partial^2 h}{\Pi^2} = -2\frac{C_L - B_L + W_L}{\Pi^3} < 0$$

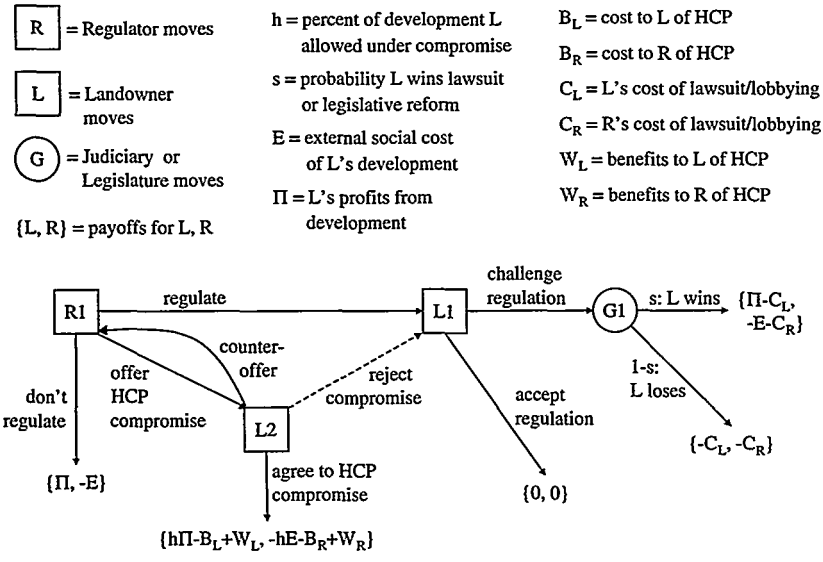
which, in calculus terms, means that the dividing line is upward-sloping and downward curving. The dividing line was mapped in h-Π space in Figure 4, and is shown below.

Figure 4. Expected Scatter Plot of HCPs When USFWS is Consistently Winning Negotiations



Now consider the modification to the game that allows L to make a counter-offer, and thereby level the playing field. This game truly becomes a game of regulatory bargaining, and is depicted in Figure 2, shown again here.

Figure 2. HCP Bargaining Model



This game now allows *L* to bargain, and possibly push *R* to the brink, making *R* agree to an HCP that is just barely acceptable rather than facing up to a challenge by *L*. Now it is possible to find *R*'s dividing line between acceptable HCPs and unacceptable HCPs, by undertaking a calculation similar to that just undertaken for *L*.

For *R*, knowing that *L* will challenge its regulatory authority at node L1 means that the payoff of an HCP must exceed the expected payoff of entering into battle with *L*, or

$$-hE-B_R+W_R > -sE-C_R$$

In order for an HCP to be acceptable to *R*, the above condition must be satisfied. Expressed in terms of the maximum *h* that *R* will tolerate in an HCP, the above condition can also be written as

$$h < s + \frac{C_R - B_R + W_R}{E}$$

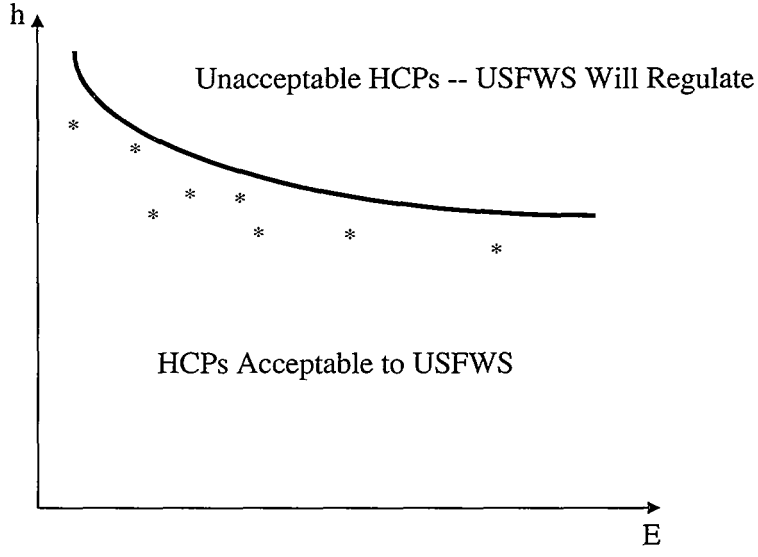
Again, it is a reasonably safe assumption that $C_R-B_R+W_R > 0$, or that the costs of facing a challenge by *L* to its authority (C_R) are greater than the costs of negotiating an HCP (B_R), especially when you throw in the collaborative benefits to *R* of an HCP (W_R).

This condition defines the dividing line for R between acceptable HCPs and unacceptable HCPs. How does a change in E change the h required to satisfy the condition? Notice that as E gets larger, the rightmost term on the right-hand side becomes smaller, and the right-hand side becomes larger. Thus, as E gets larger, the h required to satisfy the condition gets smaller. This makes sense; as E gets larger, R will care more about keeping land open for preservation, since it is higher-quality habitat, and it will take a narrower HCP (small h) to satisfy R and induce R not to challenge. And, as is the case with Π, there is a limit as to the effect E has on the necessary h. As E becomes infinitely large, the rightmost term approaches zero, and the above condition breaks down into h being smaller than s. The smaller E is, the less is its marginal effect on h. Expressed in calculus terms, the above condition for R yields the derivative relationships

$$\frac{\partial h}{\partial E} = -\frac{C_R - B_R + W_R}{E^2} < 0 \qquad \text{and} \qquad \frac{\partial^2 h}{\partial E^2} = 2\frac{C_R - B_R + W_R}{E^3} > 0$$

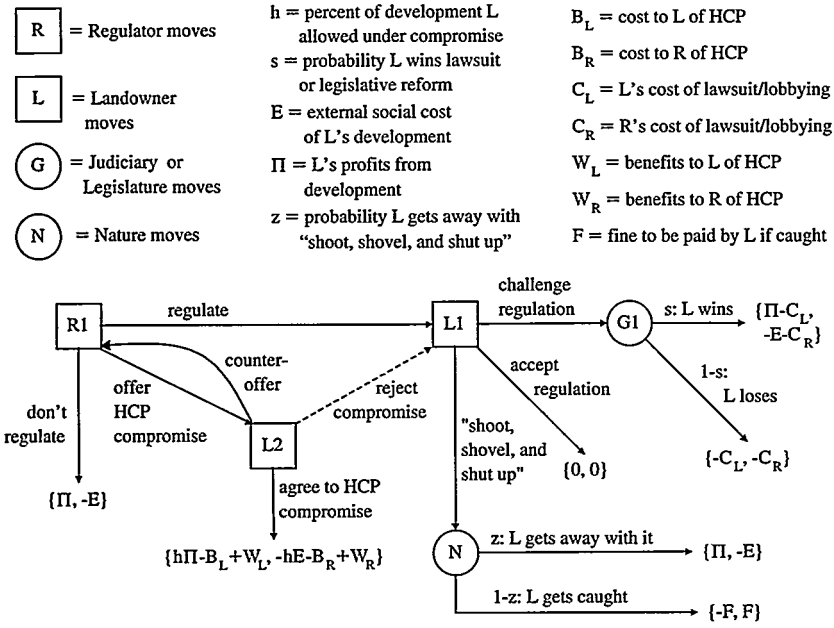
which, in calculus terms, indicate that the dividing line is downward-sloping and upward-curving. The dividing line was mapped out in h-E space in Figure 5, and is shown here again below.

Figure 5. Expected Scatter Plot of HCPs When Landowner is Consistently Winning Negotiations



Finally, consider the game whereby the SSSU option is added for the landowner. This game, depicted in Figure 3, is shown here again below.

Figure 3. HCP Bargaining Model With "Shoot Shovel and Shut Up"



The addition of the SSSU option for *L* changes her decision environment so that at node L1, she chooses from the maximum of three payoffs:

0 if she chooses to accept the regulation and forego development,
$s\Pi$-C_L if she chooses to challenge the regulation, and
$z\Pi+(1-z)(-F)$ if she chooses the SSSU option.

The expected payoff of the SSSU option can also be written as

$z(\Pi+F)-F$

The expected payoff of the SSSU option thus rises linearly with the probability of impunity (z) and rises more quickly with z than the expected payoff of challenging the regulation rises with s because z is multiplied by the term $\Pi+F$, while s is multiplied only by Π. Thus, in considering all three options and choosing the option with the maximum expected payoff, an increase in z is more likely to boost *L*'s expected payoff than an increase in s. In plain English, *L* would rather see a cut-

back in the Service's enforcement staff and improve her chances of getting away with a SSSU option than see a positive legal or judicial development.

From *R*'s point of view, its payoffs at node L1 are as follows:

0 if *L* chooses to accept the regulation,

$-sE-C_R$ if *L* chooses to challenge the regulation, and

$-zE+(1-z)F$ if *L* chooses the SSSU option

R's expected payoff if *L* chooses the SSSU option can be rewritten as

$-z(E+F)+F$

That is, *R*'s payoff if *L* pursues the SSSU option is the mirror image of *L*'s. As the probability of impunity (z) increases, *R*'s payoff decreases more quickly than the probability of a successful challenge by *L* (s) increases. In plain English, the Service as regulator in this game should be more concerned about enforcement than it should be about fending off legal or judicial challenges.

This analysis ignores the fact that legal or judicial challenges may be much more far-reaching than an isolated instance of SSSU. However, consistently lax enforcement clearly undermines the ESA, as much as or more so than the legal ambiguity of its legitimacy. The availability of the SSSU option to *L* and a high probability of her succeeding with this strategy will increase *L*'s expected payoff at the expense of R. This is enough to overcome any well-intentioned efforts to shore up the legal foundations of the ESA.

Detailed Discussion of Empirical Analysis

The fraction of land developed (h) was operationalized by dividing the actual profits of development by the potential profits that would be realized by developing the entire property. This measure of h is an imprecise measure of the true value of h, but there is no reason to believe that there is any systematic bias upward or downward. The measure of h of actual profits divided by potential profits was as follows:

$$h_i = \frac{DEVACR_i \cdot DEVVAL_i + PRESACR_i \cdot PRESVAL_i - \$\$PAID - OFFSTACR_i \cdot OFFSTVAL_i}{TOTACR_i \cdot DEVVAL_i}$$

where

$DEVACR_i$ = the number of acres the landowner is allowed to develop under HCP_i

$DEVVAL_i$ = the per-acre value of land to the landowner if she can develop it

$PRESACR_i$ = the number of acres to be set aside as GCW habitat under the HCP

$PRESVAL_i$ = the per-acre value of land to the landowner if she cannot develop it

$\$\$PAID_i$ = the amount of money that the landowner is required to pay in mitigation

$OFFSTACR_i$ = the number of off-site acres the landowner is required to acquire in mitigation

$OFFSTVAL_i$ = the per-acre cost of acquiring such offsite property

$TOTACR_i$ = the total number of acres the landowner may develop

The numerator is an estimate of the actual profits. It includes the value of the developed portion of the land as developed property; the value of the undeveloped portion of the land as open space (which often enhances the value of surrounding properties and itself enjoys some residual value); the money paid by the landowner in mitigation; and the cost of acquiring off-site land as mitigation habitat for the GCW. The denominator is an estimate of the potential profits.

The data for the variables *DEVACR*, *PRESACR*, *$$PAID*, and *OFFSTACR* were specified in the HCP. *OFFSTVAL* was typically assumed to be $1500, the standard acquisition cost for property in the Balcones Canyonlands, an area of rich GCW habitat that the Service had targeted for acquisition. The only exceptions were two HCPs in which the landowner acquired a large amount of GCW habitat in advance, and then charged against mitigation "credits" that the Service had issued, ex post, for that acquisition. *OFFSTVAL* in that case was the fraction of credits used for the HCP, multiplied by the total acquisition cost. Property values *DEVVAL* and *PRESVAL* were obtained or estimated by consulting the Travis County Central Appraisal District property directory, which is posted on the District's website.[210] The online directory contains

[210] See Travis Central Appraisal District, *supra* note 203.

information on every assessed property in the county. Using this directory, I obtained a particularized property value per acre for each HCP. In some cases, the specific property covered by the HCP was listed in the directory. In other cases, property values were estimated by examining comparable undeveloped properties in the vicinity of the HCP.

Property values are apt to be affected by applicable zoning restrictions. In Austin, there are sixteen basic zoning classifications and thirteen special use classifications.[211] These zoning classifications could well affect the ability of the landowner to develop her property, just as ESA restrictions do, but I assume that the effect of these restrictions are already capitalized into the property values I use for *DEVVAL*. That is, I assume that zoning restrictions that may affect the development potential for land have already been accounted for in a lower market value.

PRESVAL, property values for land required to be set aside as GCW habitat, were also obtained from the website directory. Some of these set-asides were listed in the website directory, so the appraised value of these sites was used as the value for *PRESVAL*. In other cases, where I could not locate from the website directory the specific property that was required to be set aside, I attempted to find a comparable property by identifying a nearby property that was substantially lower in appraised value than surrounding properties. Where I still failed to find such a comparable property, I assumed that *PRESVAL* was equal to $1500 per acre, as it is cited by the Service as the most probable value of land left in an undeveloped state.[212] A summary of statistics for these variables is contained in Table A1.

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[211] The former classifications pertain to the basic types of residential, commercial, and industrial land uses. The latter pertain to special overlay classifications, which may impose restrictions in addition to those imposed by basic classifications. Examples of the latter include special historical districts. *See* City of Austin, *Development Process: Zoning*, *at* http://www.ci.austin.tx.us/development/zonginfo1.htm (last visited Dec. 2, 2001) (on file with the Harvard Environmental Law Review).

[212] U.S. Fish and Wildlife Service, Environmental Assessment for Issuance of an Endangered Species Act Section (10)(a)(1)(B) Permit for the Incidental Take of the Golden-Cheeked Warbler (Dendroica chrysoparia) WALLACE TRACT, Mar. 1993, revised June 1994, Aug. 1994, Austin, Texas (1993).

Table A1. Summary Statistics for GCW HCPs.

Variable	Min	Max	Mean	Std Dev.
TOTACR	4	9532	838	2081
DEVACR	4	3920	410	889
PRESACR	0	5612	419	1216
$$PAID	$0	$120,000	$19,714	$35,693
OFFSTACR	0	440	74	119
OFFSTVAL	$1500	$3715	$1816	$794
DEVVAL	$10,000	$87,000	$28,884	$21,207
PRESVAL	$500	$4000	$1726	$840

The models contained in Table A1 were meant to be estimations of the derived relations

$$h > s - \frac{C_L - B_L + W_L}{\Pi} \quad \text{and}$$

$$h < s + \frac{C_R - B_R + W_R}{E}$$

These are expressions for the dividing lines between acceptable HCPs and unacceptable HCPs for the landowner and the Service, respectively. Thus, the estimation of the model

$$h_i = \beta_3 - \frac{1}{\beta_4 LOTSIZ_i + \beta_5 DIST_i}$$

is meant to test the hypothesis that the GCW HCPs conform to the model, and that the HCPs "hug" a dividing line for the landowner, meaning that the Service is winning the negotiations. The lot size (*LOTSIZ*) and the distance from downtown (*DIST*) are proxies for the profits of the planned development. Finding statistically significant relationships for these variables would indicate that these may be fairly good proxies, but not that the overall model was a good fit.

Similarly, the estimation of the model

$$h_i = \beta_0 + \frac{1}{\beta_1 HABDENS_i + \beta_2 BIRDDENS_i}$$

was meant to test the hypothesis that the HCPs were hugging a dividing line for the Service, and that landowners were winning the negotiations. The habitat density (*HABDENS*) and the bird density (*BIRDDENS*) are proxies for the external social damages that would be caused by the planned development. Again, finding a statistically significant relationship would mean that these proxies are good measures of the external social damages, but not necessarily that the overall model was a good one.

The estimation was done using a non-linear regression analysis, which, like ordinary least squares estimation, seeks to find a line that "fits" the data points as closely as possible. The results indicated that neither model was a particularly good fit for the HCP GCW data. The log-likelihood statistic is a relative indicator of how good a fit each model provides, as compared with each other. The model with the less negative log-likelihood statistic, the "Landowner winning" model, would appear to be the better one. This is not a statistically robust test, however, so to test this formally, the author employed a J-test to compare the fit of the two models statistically.[213] For testing the hypothesis that the landowner is "winning," the test involves performing the following nonlinear estimation:

$$h_i = (1-\alpha)\cdot(\beta_0 - \frac{1}{\beta_1 HABDENS_i + \beta_2 BIRDDENS_i}) + \alpha(\hat{\beta}_3 + \frac{1}{\hat{\beta}_4 LOTSIZ_i + \hat{\beta}_5 DIST_i})$$

where the β represent the estimated parameters shown in Table A1. The estimate for the parameter α has a t-distribution, so if $\hat{\alpha}$ obtained from the above estimation is significantly different from zero, then we reject the hypothesis that

$$\beta_0 - \frac{1}{\beta_1 HABDENS_i + \beta_2 BIRDDENS_i}$$

is the correct model, and reject the hypothesis that the landowner is winning. To test the competing hypothesis, the models are simply reversed in the above nonlinear estimation, and α again estimated. The results of this testing process are shown in Table A2.

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[213] *See* Russell Davidson and James G. MacKinnon, *Several Tests for Model Specification in the Presence of Alternative Hypotheses*, 49 ECONOMETRICA 781 (1981).

Table A2. Results of J-tests Using Nonlinear Models
(t-ratios in parentheses)

H_0: Landowner is "winning"	H_1: Regulator is "winning"
$h_i = \beta_0 + \frac{1}{\beta_1 HABDENS_i + \beta_2 BIRDDENS_i}$ is the correct model	$h_i = \beta_3 - \frac{1}{\beta_4 LOTSIZ_i + \beta_5 DIST_i}$ is the correct model
$\hat{\alpha} = 0.839$ (3.662)	$\hat{\alpha} = 0.699$ (2.326)

From these results, it would appear that neither model sufficiently explains the data, and that we cannot conclude that either the Service or the landowner is consistently appropriating the surplus from the HCP process. We can thus conclude tentatively that some of the HCPs are "won" by the Service, some are "won" by the landowner, and some are not "won" by either side, but are evenly split by the two parties.

The J-tests indicated that neither model was adequately explaining the data, suggesting that neither the Service nor the landowners were consistently winning the HCP negotiations. It would appear, then, that some HCPs are "won" by the Service and some are "won" by the landowner.